Closure Plans - Dewatered Sludge Landfill

Introduction

The Dewatered Sludge Landfill covers an area of approximately 6-3/4 acres. The landfill is divided into three cells. Cell #1 has an area of 2-3/4 acre and is presently active. Cells #2 and #3 have areas of 2 acres each and have not been developed or landfilled to date.

The Dewatered Sludge Landfill is used for the disposal of dewatered primary sludge, secondary sludge and aluminum-hydroxide precipitate conditioned with polymer and cement flue dust. The wastes placed in the landfill are not reactive, ignitable or corrosive, and do not exhibit the characteristics of EP toxicity.

The construction and operation of the Dewatered Landfill is provided in Section D-6a of this application. Only information related directly to closure and post-closure activities is discussed in this section.

I-1a. Closure Performance Standard

The function of the final cover, which will be applied to the Landfill cells at the end of the active life of each cell, is to protect the environment from deterioration by direct contact with the waste material and eliminate human exposure to the waste material. Infiltration and, thus, leachate formation will be minimized. A further guard against infiltration will be provided by grading all surfaces of the landfill at a one percent slope. A one percent slope will prevent pooling, while at the same time preventing excessive run-off velocities that would cause erosion. Erosion protection will also be provided by the grass cover.

The application of the final cover allows for control of pollutant migration via the air and surface water as the waste will not be exposed to the elements. Migration via the groundwater will be minimized due to control of infiltration.

Human health and safety protection, as well as protection of the environment will be provided by the application of the cover. Direct exposure to the wastes is eliminated and indirect contact through contaminated groundwater is minimized.

Post-closure maintenance will be minimized by the implementation of the first two stages of this plan. Non-contaminated surface run-off will drain by gravity to Tallaboa bay, thus making stormwater removal an automatic operation. The provisions for erosion control will minimize maintenance of the cover material. Leachate production and, thus, treatment will be minimized by the steps taken to control infiltration.

I-1b. Description of Intermediate Closure and Final Closure Activities

The operating plan for the Dewatered Sludge Landfill calls for landfilling Cell #1 to a maximum height of approximately 7 feet above grade level (+15 feet mean sea level elevation). At that time Cell #1 will be closed by applying an impermeable cover and upgrading surface drainage structures and landfilling in Cell #2 will begin. Cell #3 will be developed before Cell #2 is likewise filled to capacity and closed. Final closure of the Dewatering Landfill will commence when Cell #3 is filled to capacity. Closure plans have been developed for two cases: Intermediate Closures - when Cells #1 and #2 are closed out and, Final Closure - when Cell #3 has reached landfilling capacity and the entire landfill is closed out.

Intermediate Closure Descriptions - Cell #1 and Cell #2

Intermediate closure plans for Cells #1 and #2 consist of placing an impermeable cover over each cell at the time of closure and gravity draining the uncontaminated stormwater runoff to the Bay.

Cell #1

Drawing RCRA-PB-I1 shows Cell #1 prior to closure. The operating surface has been sloped at 1 percent grade to the south with compacted landfill material. Ditches #1, #2, #3 and #4 have collected contaminated stormwater runoff during the active life of the cell and directed it to the wastewater treatment facility. After placement of the cover, runoff will no longer require treatment.

The cover will be sloped at one percent to the south to promote drainage. The landfill practice of thoroughly compacting dewatered sludge in 6-12 inch lifts when it is placed in the landfill should make it possible to maintain this slope with integrity.

Drawing RCRA-PB-D29 shows the Dewatered Sludge Landfill after Cell #1 is closed. Cell #2 is being developed for continued landfilling. Ditch #4 on the south side of Cell #1 will be lined with concrete and will handle the major portion of uncontaminated stormwater runoff from the cover. An underground pipe will be laid along the southern edge of the landfill and will drain ditch #4 to existing manhole Q-346. A second pipe will be installed to drain manhole Q-346 south to Tallaboa Bay. The small amount of surface runoff which drains to ditches #1, #2, and #3 will continue to be pumped to the WWTF until the entire Dewatered Landfill is closed, based on the current site development plan.

In the event that landfilling operations were discontinued at the end of the active life of Cell #1, an underground pipe would be installed along the eastern edge of the landfill to gravity drain the uncontaminated runoff collected in manhole #1 from trenches #1, #2, #3 to Tallaboa Bay. Ditches #1, #2, and #3 would be lined with concrete. Drawing RCRA-PB-I2 shows the location of the drainage piping.

In the event that use of a cell must be discontinued prior to reaching full capacity and there is no foreseeable use for the cell, it will

be filled to grade elevation with dried dredge spoil material obtained on-site. The cover will then be applied as previously described. This will allow for gravity drainage of the uncontaminated runoff to the Bay.

Cell #2

Closure of Cell #2 is very similar to that previously described for Cell #1. Drawing RCRA-PB-D33 shows the landfill after Cell #2 is closed. The majority of surface drainage from the cover is collected in ditch #6 which has been tied into the underground gravity piping to Tallaboa Bay. Ditch #5 along the north of Cell 2 still drains to manhole #2 and is treated in the Wastewater Treatment Facility (the same as run-off into Ditches #1 and #2) until Cell #3 is closed.

Final Closure - Cell #3

Final closure of the dewatered sludge landfill will take place in three stages: placement of the cover in Cell #3, upgrading surface drainage collection structures in all cells and decontamination of facility equipment.

Drawing RCRA-PB-I3 shows the status of the landfill prior to final closure if the landfill is filled to design capacity. At this point, cells #1 and #2 have been closed. The covers have been applied to these two cells and have been seeded. The majority of the surface runoff drains to the bay through the gravity drainage piping on the south edge of the landfill. Runoff collected in the northern ditches of cells #1 and #2 and all of ditch #7 of cell #3 is still being pumped to the wastewater treatment plant.

Drawing number RCRA-PB-I4 shows the landfill after final closure. After the application of the cover to Cell #3, all surface runoff from the landfill will be uncontaminated. The drainage ditches along the northern boundary of Cells #1 and #2 and ditches in Cell #3 will be lined with concrete and regraded to drain to the west. Necessary underground piping connections between the northern ditches will be installed and an underground pipe will be installed along the western edge of landfill to drain them all to Tallaboa Bay.

Components of Closure

Cover Construction

The cover for Cell #1 will be two feet thick and will consist of three layers. A soil blend such as caliche mixed with bentonite so that the compacted material has a permeability of 10^{-7} cm/sec, will comprise the bottom 15 inches. Three inches of sand will be applied over this layer. The final 6 inches of cover will be top soil. After placement of the top soil, the surface of the landfill will be seeded with short-rooted native grass. Both the caliche and top soil will be obtained locally from off-site sources. Hauling and placement of the cover materials will be done by contract personnel.

The bottom liner for Cell #1 consists of 2 feet of recompacted caliche, a native cohesive calcium carbonate marine soil. Sodium bentonite slurry walls extend down through dike walls of the landfill into a relatively impervious silty clay (permeability 1 x 10^{-7} cm/sec) as described in the Dewatered Landfill Facility description section (D-6a(2)) of this permit application. The proposed cover for Cell #1 will, therefore, be as impermeable as the liner system for this cell.

Cells #2 and Cell #3

The cover for Cells #2 and #3 will consist of five layers. The caliche/bentonite mixture described for Cell #1 will comprise the bottom 12 inches. A 3-inch layer of bedding sand will be placed over the caliche/bentonite layer. A 20 mil thick synthetic liner will be placed over the sand to provide a cover that is no more permeable than the bottom liner which will be constructed of synthetic material. An additional 3-inch layer of sand will protect the synthetic liner and a 6-inch top soil layer will complete the cover. The surface of the landfill will be seeded with short-rooted native grass. The cover soils will be obtained locally from off-site sources. Installation of the entire cover, including synthetic liner, will be done by contract personnel.

The bottom liner system proposed for Cell #2 and #3 includes a synthetic liner. The cover system for Cell #2 and #3 will have a permeability less than or equal to the bottom liner.

Cover Settlement/Subsidence

The Dewatered Sludge Landfill is used only for dewatered sludges, no drums or other materials are landfilled therein. The sludge is combined with cement flue dust and compacted in the landfill in 6-inch to 12-inch lifts by traversing with a bulldozer 5-6 times. This procedure maximizes compaction and will minimize future settlement. Local subsidence should not be a problem.

The cover will be resurveyed during the post-closure care period to assure that the designated 1 percent slope will be maintained. Soil fill will be added and reseeded, as necessary.

Leachate Management

The leachate collection systems for Cells #1, #2 and #3 are described in Section D-6a(4) of this permit application. Cell #1 of the Dewatered Landfill does not have a synthetic liner system. Since the bottom of the landfill is approximately 10 feet below sea level, sea water infiltration will occur into this cell. Leachate will be pumped from Cell #1 and treated at the wastewater treatment facility during the post-closure care period or until it is demonstrated that pumping and treatment is no longer necessary.

Cells #2 and #3 of the landfill will incorporate synthetic liners and leachate collection systems. After the impermeable cover is applied to these cells at closure, very little further leachate will be generated. It is anticipated that these leachate collection systems will be used to monitor for leaks in the liners, rather than for active leachate removal.

Closure Certification

During closure, the certifying professional engineer will inspect the closure activities every two weeks.

I-1c Waste Inventory

The Dewatered Landfill is a disposal facility, therefore, no wastes are in storage therein.

I-1d Equipment Decontamination

The final step of facility closure will be decontamination of facility equipment. At this time a bulldozer is the only large piece of equipment used at the facility. A dump truck will be incorporated into the landfilling operations when Cells #2 and #3 become active. Other structures and equipment which will require decontamination are leachate collection and stormwater sumps and pumps.

The decontamination procedure will consist of flushing the equipment with water using hydroblasting equipment. All flush water will be processed in the wastewater treatment plant. The decontamination effectiveness will be evaluated by visual inspection for cleanliness. After decontamination, equipment will be sold or retained for other purposes as appropriate.

I-1e Schedule of Closure Activities

The capacity of the Dewatered Sludge Landfill is estimated at 170,000 cubic yards inclusive of sludge and blending materials. Based on projected sludge generation rates and past blending practices, the expected years of closure for Cells #1, #2, and #3 are 1990, 2012 and 2034, respectively.

Table I-1 shows the activities and timing for intermediate closure of Cell #1. The estimated time to close this cell is 19 weeks if the cell is

filled to capacity at the time of closure and landfilling is continued as planned in Cell #2. Closure under these circumstances will be accomplished within the 180 day time frame barring weather problems.

Additional closure activities and time will be required if use of the cell is discontinued prior to its reaching grade level. If the cell will not be used in the future then it will be filled to grade with on-site dredge fill material before the cover is applied. This could require approximately 7 additional weeks.

If the landfill will be permanently closed at that time, additional activities will be required to upgrade the northern ditches of the cell to drain to the Bay. The additional time required for these activities is 7 weeks. The total time of closure required with these two additional activities is 33 weeks or 230 days. The EPA Administrator will be notified of the status of the landfill and the estimated length of closure activities prior to cell closure.

Cell #2 will follow the same closure activities and time frame as Cell #1.

Table I-2 shows the final closure activities and schedule for Cell #3. The final closure can be accomplished in 180 days (26 weeks) if the cell does not need to be filled to grade with dredge material as previously described. If backfilling is required the closure could require an additional 7 weeks. This will be discussed with the EPA prior to closure.

TABLE I-1
SCHEDULE FOR INTERMEDIATE CLOSURE OF DEWATERED SLUDGE LANDFILL CELL #1

STEP	ACTIVITY	TIMING
(1)	Last quantity of waste received in Cell #1	Day 0
(2)	Waste is spread and compacted	Day 1
(3)	Apply cover materials to Cell #1. Spread and compact 15 inches of caliche/bentonite blend over the cell surface, spread 3 inches of sand and 6 inches of topsoil. Seed the surface.	Week 1-14
(4)	Install underground pipe along south side of landfill	Week 14-17
(5)	Line Ditch #4 with concrete, connect to underground drainage pipe. Seed area around Ditch #4	Week 17-19
	TOTAL TIME	19 weeks

Additional activities/time needed if Cell #1 is permanently closed before it is filled to grade.

(2.5)	Fill cell to grade level with on-site dredge spoil material	Additional 7 weeks
(6)	Install underground sewer on east side of landfill to drain low areas on the north side of Cell 1. Provide hookup to manhole #1.	Additional 2 weeks
(7)	Line ditches #1, #2 and #3 with concrete excavating as necessary. Flush pump in manhole #1 with water pumping water to WWTP. Remove pump and salvage.	Additional 2 weeks
(8)	Reseed areas around ditches #1, #2, and #3 with grass	Additional 1 week
(9)	Decontaminate bulldozer with water using hydroblast equipment	Additional 2 weeks
	Total time including additional activities	33 weeks

TABLE I-2
FINAL CLOSURE OF THE DEWATERED SLUDGE LANDFILL CELL #3

STEP	ACTIVITY	TIMING
(1)	Last quantity of waste is accepted at the landfill	Day 0
(2)	Waste is spread and compacted Cell #3	Day 1
(3)	Apply cover materials to Cell 3. Spread and compact twelve inches of caliche/bentonite blend over the area. Spread three inches of sand over the caliche/bentonite, and install a 20 mill synthetic liner over the sand. Apply three inches of sand on top of the liner. Spread six inches of top soil over the surface of Cell. Fill in western side of ditch #7.	Week 1-12
(4)	Seed surface of Cell 3	Week 13
(5)	Install underground sewer on west side of landfill to drain low areas on the north side of the facility. Provide connection for northwest corner of ditch #7 to sewer.	Week 10-15
(6)	Line ditch #8 with concrete. Connect ditch to sewer on west side of landfill.	Week 16
(7)	Reroute northern ditches to drain by gravity to sewer on west side of landfill:	Week 16-24

-- Ditch #7: Reslope ditch to drain west. Line ditch with concrete. Connect ditch to new underground sewer.

-- Manhole #3: Install line to drain manhole #3 to ditch #7.

-- Manhole #2: Install line to drain manhole #2 to manhole #3. Flush pump in manhole #2 with water. Pump flush water to WWTP. Remove pump and salvage.

-- Ditch #2: Connect ditch #2 to ditch #5, reslope to drain west, line with concrete.

TABLE I-2 (continued)

FINAL CLOSURE OF THE DEWATERED SLUDGE LANDFILL CELL #3

STEP	ACTIVITY	TIMING
	-- Ditch #1: Line ditch with concrete, excavating as necessary.	
	-- Ditch #3: Plug line connecting ditch to sump D-850. Line ditch with concrete, excavating as necessary. Install underground line to drain ditch #3 to ditch #1.	
(8)	Reseed areas around ditches with grass	Week 25
(9)	Decontaminate bulldozer and dump truck by flushing with water using hydroblast equipment	Week 25-26
	TOTAL TIME	26 weeks

Additional activities/time needed if cell needs to be brought up to grade level with dredge spoil before closure.

(2.5)	Fill cell to grade with on-site dredge fill material	Additional 7 weeks
	Total time including additional activity	33 weeks

Closure Plans - Wastewater Treatment Facility Surface Impoundments:
East and West Primary Solids Ponds
Aeration Basins #1 and #2
Equalization Basins #1 and #2

Introduction

The Wastewater Treatment Facilities include six surface impoundments: two primary solids ponds, two flow equalization basins and two aerated bioreactor basins for the activated sludge process. The construction and operation of these impoundments is discussed in Section D-4 of this application. Drawing RCRA-PB-I5 shows the primary solids ponds. Drawings RCRA-PB-I6 shows the aeration and equalization basins. Only information related to closure of the impoundment is discussed in this section.

The life of each of these impoundments is related to the life of the plant itself. These impoundments will be used as long as the plant is operated, thus their life is considered to be infinite in nature. For the purpose of preparing closure cost estimates, a life of twenty years is considered reasonable and has been assumed for each of the impoundments.

The sequence of closure for these impoundments is: first, the Primary Solids Ponds; second, the Equalization Pond,. Panic Pond, and East Aeration Basin; and, third, the West Aeration Basin. Closing the facilities in this order allows maximum use of the wastewater treatment plant and landfill facilities during closure. These plans have been developed such that all hazardous wastewater and solid wastes from these impoundments can be disposed of on-site.

Throughout the closure plans described below, it is assumed that hazardous solids will be hauled to the Industrial Landfill for disposal. Based on the current projected fill rate of the Industrial Landfill, it is estimated that this assumption will be valid for approximately 23 years. At that time the closure plans and cost estimates will be modified to reflect a change in the final disposal location for hazardous solids removed from the wastewater treatment impoundments.

Closure Plans - Industrial Landfill

Introduction

The Industrial Landfill is located in the northern portion of the main plant and covers a total area of 20 acres. A portion of the site, 6.5 acres, consists of controlled areas within and around the facility for access roads, fences, and maintenance of a boundary between the disposal area and the public road adjacent to the facility. The remaining 13.5 acres are designated for disposal of hazardous and non-hazardous wastes. Drawing RCRA-PB-D42 shows the Industrial Landfill and designated areas therein.

Hazardous wastes are landfilled in Area I, Area II, and Area III of the site. Area I, Area II, and Area III cover 1.4 acres, 4.8 acres, and 7.3 acres of the total facility area respectively.

I-1a Closure Performance Standard

The function of the final cover which will be applied to each Landfill area is to protect the environment from deterioration by direct contact with the waste material and to eliminate human exposure to the waste material. Infiltration and thus leachate formation will be minimized by the use of a layer of materials of 10^{-7} cm/s permeability. A further guard against infiltration will be provided by grading the surfaces of the disposal area at a one percent slope. A one percent slope will prevent pooling while at the same time it should not cause the run-off velocity to be so great that erosion will be enhanced. Erosion protection should be provided by the grass cover.

The application of the final cover provides control of pollutant migration via the air and surface water as the waste will not be exposed to the elements. Human health and safety protection as well as protection of the environment will be provided by the application of the cover. Direct exposure to the wastes is eliminated and indirect contact through contaminated groundwater is minimized.

Post-closure maintenance and care will be minimized through the implementation of this plan. Clean run-off will drain by gravity to the Main Cooling Water Return Lateral and then to the Bay. Leachate production and thus treatment will be minimized by the steps taken to minimize infiltration. The provisions for erosion control will minimize maintenance of the cover material.

I-1b Description of Closure Activities

Under the current development plans for the Industrial Landfill, Areas I, II and III will be landfilled in consecutive order. Each area will be landfilled and covered before the next area is landfilled. As part of the standard operating procedure the active landfill surface is covered with a six inch layer of caliche soil. At the time of closure, 18 inches of additional cover material will be added to obtain a total cover thickness of two feet. The cover will be graded to surface drainage ditches which will handle stormwater run-off. The cover will then be seeded with grass.

Area I and Area II

Areas I and II will each be landfilled to a maximum height of approximately 13 feet abovegrade before closure of each cell commences. Ditch #1, located along the northern boundary of these areas will function to collect stormwater run-off from the areas during their active lives. The stormwater run-off is collected in the stormwater holding pond located at the southwestern edge of the Landfill and then pumped to the Wastewater Treatment Facility. The impermeable cover applied at closure of each of these cells will be sloped at one percent to the north. Ditch #1 will continue to collect stormwater run-off which will be directed to the Wastewater Treatment Facility until Area #3 is closed and all run-off from the Landfill will be routed directly to the cooling water return canal.

Area III

Area III will be developed to a maximum height of 13 feet abovegrade before it is closed. During the active life of Area III, stormwater run-off will be directed to ditch #2 located north of this area. This ditch empties into the stormwater holding pond. The impermeable cover applied at closure of Area III will be sloped at one percent to the north. Ditch #2 will continue to collect stormwater run-off after closure. The stormwater run-off from ditches #1 and #2 will be combined into another ditch, however, and this flow will be routed via gravity to the cooling water return lateral. After the closure of Area III all ditches will be lined with concrete to minimize erosion.

The facility equipment, i.e., bulldozer and dump truck, will be decontaminated by hydroblasting after the facility is closed. The equipment will be returned to the contractor after decontamination.

Components of Closure

Cover Construction

The cover for the Industrial Landfill Areas I, II and III will consist of four layers. The first layer consists of 6 inches of caliche which is placed on top of the landfill material as daily cover. The second layer will consist of 9 inches of a soil blend of caliche and bentonite, which will be recompacted to a permeability of 10^{-7} cm/sec or less. A 3 inch layer of sand and a 6 inch layer of top soil will be provided on top of the caliche/bentonite layer. After placement of the top soil the cover will be seeded with native short-rooted grass. Both the caliche and top soil will be obtained locally from off-site sources. Hauling and placement of all materials will be by contract personnel.

The Industrial Landfill does not have a bottom liner system. The soils beneath the Landfill have permeabilities which range from 10^{-2} cm/sec to 10^{-5} cm/sec. The cover system will, therefore, be less permeable than the bottom materials.

Cover Settlement/Subsidence

The cover will be resurveyed yearly as part of the post-closure maintenance and fill soil added to maintain a one percent slope on the cover.

Leachate Management

The Industrial Landfill has no leachate collection system.

Closure Certification

During closure the certifying engineer will inspect the closure activities every two weeks.

I-1c Waste Inventory

The Industrial Landfill is a disposal facility, therefore, no wastes are in storage therein.

I-1d Equipment Decontamination

The final step of facility closure will be decontamination of facility equipment. At this time, a bulldozer and front-end loader are the only pieces of major equipment used at the facility. During closure, dump tricks, additional front-end loaders and graders will probably be used. The only piece of minor equipment is the stormwater pond pump.

The decontamination procedure will consist of flushing the equipment with water using hydroblasting equipment. All flush water will be processed in the Wastewater Treatment Plant. The decontamination effectiveness will be evaluated by visual inspection for cleanliness. After decontamination, equipment will be sold or retained for other purposes as appropriate.

I-1e Schedule of Closure Activities

The total capacity of the landfill is 240,000 cubic yards. The capacity reported herein is based on landfilling in Areas I, II, and III of the site only. The facility has a life of twenty-five years. The life estimate is based on receiving wastes at the facility from two sources. The first source is both hazardous and non-hazardous wastes generated at the plant on a daily basis plus the volume of material necessary to apply a six inch daily cover over the wastes. The second source is the materials that will be removed from the Primary Solids Ponds, Equalization Pond, Panic Pond, and East and West Aeration Basin for disposal in the Industrial Landfill as described in the closure plans for the Wastewater Treatment Facilities.

In the event that the Wastewater Treatment Facilities remain in operation past the estimated twenty-five year life reported for the Industrial Landfill, the volume allowance reserved for disposal of the solids from the Wastewater Treatment Facilities will be modified to reflect the change in estimated facility life. Also, the closure plan and cost estimates for affected Wastewater Treatment Facilities will be modified to reflect a change in the intended final disposal area for solids removed from the impoundments. If the facility were used only for wastes generated daily then the life would be forty-six years. With the present solid waste generation rate, partial closure, i.e., applying the final cover material to Area I and Area II, are estimated to occur in the third and fifteenth year of operation.

The schedule for final closure of ~~Cell #3~~ Area III of the Landfill is shown in Table I-6. It is estimated that about 26 weeks will be required for closure. If the facility is closed while Area I or Area II is active, then closure would require additional time. This is because all Areas in the Industrial Landfill will be covered at the final closure of the landfill. The additional time required would be approximately 10 weeks for a total of 36 weeks.

TABLE I-6

FINAL CLOSURE OF THE INDUSTRIAL LANDFILL

(1)	Last quantity of waste is accepted at the landfill Area III	Day 0
(2)	Waste is spread and compacted at the facility	Day 1
(3)	Cover Area III with caliche/bentonite mixture and compact; cover with three inches of sand and six inches of top soil.	Week 1-20
(4)	Seed Area III with grass	Week 21-22
(5)	Install stormwater ditch #3; line all three stormwater ditches with concrete	Week 23-25
(6)	Decontaminate equipment	Week 26
	TOTAL TIME	26 weeks

Closure Plans - Drum Storage Area

General

The warehouse facility which includes Building #462 and a secure fenced area next to that building is located in plant zone 46. This closure plan describes the removal of the hazardous waste inventory and decontamination of the facility.

I-1a Closure Performance Standard

All drums of hazardous waste will be removed from the warehouse area. Any contaminated solid materials will be removed and properly disposed in the Industrial Landfill. The warehouse will therefore no longer be a concern from an environmental or health standpoint.

I-1b Description of Closure Activities

The materials stored at the warehouse include drums of raw materials, additives, solvents and any other chemicals used in small quantities in the plant. The normal procedure for materials which have become out-of-date, contaminated or are otherwise rejected from use is to segregate and dispose of them by one of four methods: recycle to the in-plant process units, sale outside of Union Carbide for reuse/recovery, burned in the plant boilers for energy recovery or treated in the plant wastewater treatment facility. The drums are emptied using a vacuum truck and later reused on-site or disposed in the Industrial Landfill if unusable. Any contaminated soil or pallets are disposed in the Industrial Landfill. This procedure will be used for closure.

Future storage of hazardous wastes will be handled in another in-plant storage area which will be exempted from regulation under the 90 day rule.

I-1c Maximum Waste Inventory

There should be no drums present when closure commences.

I-1d Decontamination

Decontamination of the storage drums which handled hazardous wastes in the warehouse will be performed by emptying them using a vacuum truck. The drums will be reused for storing other products or disposed in the Industrial Landfill if unusable.

Any pallets or soil which is contaminated with hazardous waste will be disposed in the Industrial Landfill. The method used to determine the depth of soil contamination and judge the adequacy of soil removal will be visual inspection. Certification of decontamination will be provided by a registered professional engineer.

I-1e Schedule of Closure

Closure will commence immediately after EPA approval of this Closure Plan. The schedule of activities and duration of closure are shown in Table I-8.

TABLE I-8

ACTIVITIES/SCHEDULE FOR WAREHOUSE CLOSURE

1.	Remove last drums of waste from warehouse by vacuum truck	1 week
2.	Reuse hazardous wastes in plant boilers for energy recovery, treat in WWTP or sell inside/outside of UCCI for material/ energy recovery.	3 weeks
3.	Dispose empty drums in Industrial Landfill or clean and reuse on-site.	3 weeks
4.	Remove contaminated soil/pallets, etc. from warehouse and dispose in Industrial Landfill.	3 weeks
5.	Certify that closure is complete.	1 week

I-4 Closure Cost Estimates

Dewatered Sludge Landfill

The closure cost estimate for the Dewatered Sludge Landfill was developed for the most expensive closure possible. This involves the final closure of Cell #3, which includes backfilling Cell #3 with dredge material, upgrading surface drainage structures in Cells #1 and #2 and equipment decontamination.

The cost estimate is attached and reflects a $310M cost in 1983 dollars.

Primary Solids Ponds

The closure costs for the primary solids ponds include the planned activities to landfill the pond contents in the Industrial Landfill and implement the contingency closure plans. The cost of closure is estimated at $580M in 1983 dollars. The cost estimate is attached.

Aeration Basins/Equalization Basins

The closure cost for the aeration and equalization basins include the planned closure activities to decontaminate these facilities plus the cost of implementing the contingency closures. The combined cost of these activities is estimated at $720M in 1983 dollars.

Industrial Landfill

The enclosed cost estimate has been prepared based on the facility being closed prior to the time when the operation would be extended to Area II and Area III. The additional costs for cover materials for these areas and the labor to apply the cover would make closure of the facility most expensive at that time. The estimated cost of closure is $1,280M in 1983 dollars.

Storage Tanks

The cost of decontaminating the hazardous waste storage tanks and associated equipment are attached and are summarized below. The cost estimates reflect 1983 dollars.

Tank	Closure Cost
Energy Systems Residue Tanks #473,#474,#480	$23M
Environmental Protection Department Reside Tanks 1001, 1002, 1010	$20M
Phenol/Acetone Residue Tanks #324, #754	$15M

Filter Presses

The cost to decontaminate the filter presses for closure is $42M in 1983. The cost estimate is attached.

Groundburners

The cost to decontaminate the groundburners, associated equipment, and groundburner pit is estimated at $15M in 1983. The cost estimate is attached.

Drum Storage Area

The cost to close the drum storage area at the warehouse is estimated at $12M in 1983. The cost estimate is attached.

I-5 Financial Assurance Mechanism for Closure

Please see Section I-7.

I-6 Post-Closure Costs

Dewatered Sludge Landfill

The estimated annual cost of post-closure activities described for the Dewatered Sludge Landfill is $34,500 in 1983. The cost estimate is attached.

Wastewater Treatment Facility Surface Impoundments

The estimated annual cost of contingency post-closure activities described for the Primary Solids Ponds is $38,600 in 1983. The cost estimate is attached.

The estimated annual cost of contingency post-closure activities described for the Aeration Basins and Equalization Basins is $19,900 in 1983. The cost estimate is attached.

Industrial Landfill

The estimated annual cost of post-closure activities described for the Industrial Landfill is $85,000 in 1983. The cost estimate is attached.

I-7 Financial Assurance for Closure and Post-Closure Care

Attached is Union Carbide Corporation's most recent filing to demonstrate compliance with the financial responsibility requirements under 40 CFR Part 265. Please note that the Union Carbide Caribe Inc. facility (a wholly-owned subsidiary of Union Carbide Corporation) at Ponce is included in

paragraph 4 of the letter since Puerto Rico has been granted interim authorization for Phase I but does not have any financial responsibility requirements equivalent to the Federal requirements. However, the estimated closure and post-closure costs for Ponce are, as required, included in the figures used to show that Union Carbide Corporation meets the financial test.

Since the requirements of 40 CFR Part 264 are not currently applicable to the Ponce plant, we are not required at this time to place the Ponce figures in paragraph 2 of the letter nor to issue a corporate guarantee. It is our intention to issue the guarantee and demonstrate compliance with the 40 CFR Part 264 standards prior to issuance of the final RCRA permit for Ponce, at which time 40 CFR Part 264 becomes applicable.

I-8 Liability Requirements

The Ponce Plant has liability coverage for sudden accidental occurrences in the amount of $1 million per occurrence with an annual aggregate of $2 million exclusive of legal defense costs. (See attached letters.)

The Ponce Plant also has liability coverage for non-sudden accidental occurrences in the amount of $3 million per occurrence with an annual aggregate of $6 million exclusive of legal defense costs. (See attached letter.)

I-9 State Assumption of Liability

The Ponce Plant will not request state assumption of legal or financial responsibilities.

ATTACHMENTS

ATTACHMENT I-1

Closure Cost Estimates

	1983 Costs
Dewatered Sludge Landfill	$310M
Wastewater Treatment Facility Impoundments	
Aeration Basins/Equalization Basins	$720M
Primary Solids Ponds	$580M
Industrial Landfill	$1,280M
Storage Tanks	
Energy Systems Tanks	$23M
Environmental Protection Dept. Residue Tanks	$20M
Phenol Acetone Residue Storage Tanks	$15M
Filter Presses	$42M
Groundburners	$15M
Warehouse	$12M

UNION CARBIDE

ACCT.	DESCRIPTION	MAN HOURS	DOLLARS IN THOUSANDS			
			LABOR	SUB-CONTRACT	MATERIAL	TOTAL
0-5xxxx 7xxxx	Summary: Direct Labor and Materials	—	—	187.3	—	187.3
6xxxx	Summary: Indirect Labor and Materials	—	—	—	—	—
	Sub-Total					187.3
	Site Administration: 5 % of ~~Direct labor~~ SUBCONTRACT					9.4
	Subcontract Overhead:					
	Sub-Total					
8067	ENGINEERING: In-house 10% of SUBCONTRACT					18.7
8068	Contract					
	Sub-Total					215.4
9	Contingencies (Note 1): 25% of SUBTOTAL					54.6
	TOTAL ESTIMATE (*1981 COSTS) (*1983 Cost @ 7% inflation per year)					*270.0 310.0

1: Contingencies are allowances for undefined and unforeseeable deviations from the ideal progress of the job.
Examples of items which may be covered by contingencies are the costs caused by: Unforeseen field changes
thin original project scope, Construction problems, Strikes, Delays in material delivery, Force majeure, etc.
ges in scope are specifically excluded.

	CRAIG WILGER
RTMENT	X 3707
RPORATION	RM 3417
G/HYDROCARBONS	MC 1981

TITLE			
DEWATERED SLUDGE LANDFILL CLOSURE COST CELL #3 (*1981 COSTS)			
LOCATION	COST ENGINEER	REQUEST NO.	DATE
PONCE-293	WPI	—	11/17/83
ESTIMATE TYPE		SHEET NO.	ORDER NO.
± 40%		—	930-

ITEM NUMBER	DESCRIPTION	QUANTITY	UNIT	LABOR MANHOURS UNIT	LABOR MANHOURS TOTAL	MATERIAL UNIT $	MATERIAL TOTAL $	TOTAL COST $
1.	DREDGE SPOIL FILL MATERIAL & HAUL 1 MILE	52000	cy		—	0.74	38,500	
	SPREAD & COMPACT SPOIL FILL MATERIAL	75000	SF		—	0.30	22,500	
2.	PLACE CALICHE & BENTONITE MIX (IN 4" LIFTS)	2750	cy		—	3.70	10,200	
	INCLUDES MIXING & COMPACTING							
3.	HAUL SAND IN FROM OFFSITE & SPREAD 3" TK.	700	cy		—	2.50	1800	
4.	PLACE SYNTHETIC LINER OVER SAND 75000x1.05	79000	SF		—	.20	15,800	10¢/SF for LINE
5.	HAUL SAND IN FROM OFFSITE & SPREAD 3" TK	700	cy		—	2.50	1800	
6.	PLACE TOPSOIL OVER SAND & GRADE 6" TK	1400	cy		—	2.60	3600	
7.	SEED TOPSOIL WITH GRASS	74000	SF		—	0.32	23,700	
8.	EXCAVATE #7 & #8 DITCHES 2'x5'x500'	185	cy		—	4.32	800	
9.	CONCRETE LINE DITCHES # 1,2,3,5,7,8	275	cy		—	200	55000	
10.	UNDERGROUND SEWER SYSTEM:							
	EXCAVATE	300	cy		—	1.92	600	
	BACKFILL	100	✓		—	0.74	100	
	30" ϕ 608W2 CONCRETE SEWER PIPE	500	LF		—	18.00	9000	
	MISC. MATL				—		1000	
	TEST & CLEAN				—		500	
	HAUL & SHAKEOUT				—		300	
11.	DECONTAMINATE OPERATING FACILITY EQUIPMENT							
	BULL DOZER, DUMP TRUCK, STORM WATER PUMP				—		} 2100	
	MANHOLES #1, 2, 3				—			
			SUBTOTAL BASE LABOR					
	SUBTOTAL		MH FACTOR					
	TOTAL		$ RATE		—		187,300	

T-73-

ENGINEERING DEPARTMENT
UNION CARBIDE CORPORATION
CHEMICALS AND PLASTICS

ESTIMATE – LABOR AND MATERIAL

TITLE	SHEET NO.	DATE
EARTHWORK – SUBCONTRACTS	—	11/17/8
	LOCATION 293	REQUEST NO. —
CLERK / TECHNICIAN / COST ENGR.	WORK ORDER	ACCOUNT

CCT	DESCRIPTION	MAN HOURS	DOLLARS IN THOUSANDS			
			LABOR	SUB-CONTRACT	MATERIAL	TOTAL
0-5xxxx 7xxxx	Summary: Direct Labor and Materials		—	132.6	—	132.6
6xxxx	Summary: Indirect Labor and Materials		—	—	—	—
	Sub-Total					132.6
	Site Administration: % of Direct labor					—
	Subcontract Overhead: 5% of S/C					6.4
	Sub-Total					139.0
8067	ENGINEERING: In-house 10% of S/T					14.0
8068	Contract					
	Sub-Total					153.0
9999	Contingencies (Note 1): 25% of S/T					37.0
	TOTAL ESTIMATE (*1981 Costs) (**1983 Costs escalated at 7% per year)					*190.0 **218.0

NOTES: 1. Contingencies are allowances for undefined and unforeseeable deviations from the ideal progress of the job. Examples of items which may be covered by contingencies are the costs caused by: Unforeseen field changes within original project scope, Construction problems, Strikes, Delays in material delivery, Force majeure, etc. Changes in scope are specifically excluded.

ENGINEERING DEPARTMENT
UNION CARBIDE CORPORATION
CENTRAL ENGINEERING/HYDROCARBONS

CRAIG WILGER
X3707
MC 1981

ESTIMATE SUMMARY
COE-108

TITLE			
AERATION BASIN #1 (WEST) PONCE			
LOCATION	COST ENGINEER	REQUEST NO.	DATE
293	JBC/WPI	—	11/21/83
ESTIMATE TYPE		SHEET NO.	ORDER NO.
± 25%		1-3	930-

ITEM NUMBER		QUANTITY	UNIT	LABOR MANHOURS UNIT	LABOR MANHOURS TOTAL	MATERIAL UNIT $	MATERIAL TOTAL $	TOTAL COST
	...NT REMOVAL							
	...CE AERATORS	4	EA				11 900	
	INCLUDES USE OF CRANE							
	BOAT RAMP						3100	
	PLAT FORM						3300	
	CLEANING EQUIPMENT BY HYDRO BLASTING						2000	
	FLUSH WATER TO AERATION BASIN #1							
	DEMOLISH RAMP & HAUL TO LAND FILL						1000	
	DEWATER POND							
	USE PORTABLE PUMPS (3)						3500	
	EXCAVATE SLUDGE - BLENDING WITH 2/1 VOLUME OF DREDGE SPOIL							
	DREDGE SPOIL BROUGHT IN	3760	CY			1ST	6200	PROVIDE FROM FOR
	BLENDING OF SLUDGE & DREDGE SPOIL							FROM 1980
	REMOVAL OF SLUDGE/DREDGE SPOIL MIXTURE	5710	CY			2ND	12100	
					SUBTOTAL DIRECT LABOR			
	SUBTOTAL				MH FACTOR			
	TOTAL				$ RATE			

Z-75-

ENGINEERING DEPARTMENT
UNION CARBIDE CORPORATION
CHEMICALS AND PLASTICS

TITLE AERATION BASIN #1 (WEST)
PONCE

SHEET NO. 2-3
LOCATION 293

DATE 3/
REQUES

CLERK | TECHNICIAN | COST ENGR | WORK ORDER | ACCOU

ITEM NUMBER	DESCRIPTION	QUANTITY	UNIT	LABOR MANHOURS UNIT	LABOR MANHOURS TOTAL	MATERIAL UNIT $	MATERIAL TOTAL $	TO CO
	EXCAVATE RIP RAP & CONCRETE LINER & HAUL TO LANDFILL							
	RIP RAP	1943	CY			4.50	8700	
	CONCRETE LINER	218	—			34.40	7500	
	TESTING: SOIL SAMPLES	3	EA				3000	
	EXCAVATE CONTAMINATED SOIL	5008	CY			2.10	10500	PROVIDE FROM FROM 19
	LANDFILL MAT'LS IN N.W. LANDFILL SPREADING, COMPACTING, & COVERING	12909	CY			1.25	16200	
	6' FENCE SURROUNDING BASIN	500	LF			9.00	4500	
	CONTINGENCY CLOSURE: BACKFILL & COMPACT BASIN SURFACE WITH CALICHE	5000	CY			3.50	17500	
	RESEED BASIN SURFACE	67500	SF			0.32	21600	
	SUBTOTAL			SUBTOTAL BASE LABOR			132,600	132
	TOTAL			MH FACTOR $ RATE	—		~~89000~~	~~89~~

-96-I

ENGINEERING DEPARTMENT
UNION CARBIDE CORPORATION
CHEMICALS AND PLASTICS

TITLE AERATION BASIN #1 (WEST)
PONCE

SHEET NO. 3-3
LOCATION 293

CARBIDE

CCT	DESCRIPTION	MAN HOURS	DOLLARS IN THOUSANDS LABOR	SUB-CONTRACT	MATERIAL	TOTAL
0-5xxxx 7xxxx	Summary: Direct Labor and Materials	PART I EQUALIZATION PONDS PART II AERATION BASIN EQ PART III EXTENDED AERATION		161.1 129.3 16.7	—	307.1
6xxxx	Summary: Indirect Labor and Materials	—	—	—	—	—
	Sub-Total					307.1
	Site Administration: % of Direct labor					—
	Subcontract Overhead: 5% of S/C					15.9
	Sub-Total					323.0
8067	ENGINEERING: In-house 10% of S/T					32.0
8068	Contract					
	Sub-Total					355.0
9999	Contingencies (Note 1): 25% of S/T					85.0
	TOTAL ESTIMATE (* 1981 cost) (** 1983 costs escalated at 7% per year)					*440.0 **502.0

NOTES:

1. Contingencies are allowances for undefined and unforeseeable deviations from the ideal progress of the job. Examples of items which may be covered by contingencies are the costs caused by: Unforeseen field changes within original project scope, Construction problems, Strikes, Delays in material delivery, Force majeure, etc. Changes in scope are specifically excluded.

ENGINEERING DEPARTMENT
UNION CARBIDE CORPORATION
CENTRAL ENGINEERING/HYDROCARBONS

CRAIG WILCOX
x 3707
mc 1981

TITLE: CLOSEOUT EQUILIZATION PONDS & AERATION (EAST) BASIN # 2 & CONVERT TO EXTENDED AERATION

LOCATION	COST ENGINEER	REQUEST NO.	DATE
293	JBC/WPI	—	11/21/83
ESTIMATE TYPE: ± 25% STUDY		SHEET NO. 1/7	ORDER NO. 930-

ESTIMATE SUMMARY

COE-108

NO.	DESCRIPTION	QUANTITY	UNIT	LABOR MANHOURS UNIT	LABOR MANHOURS TOTAL	MATERIAL UNIT $	MATERIAL TOTAL $	TOTAL COST $
	EQUIPMENT REMOVAL							
	FLOW INDUCER Y-360 (15HP)	1	EA				900	
	OIL SKIMMER	2	EA				1500	
	JET MIXER	1	—				1500	
	CLEAN EQUIPMENT BY HYDROBLASTING						2000	
	FLUSH WATER TO PONDS							
	DEMOLISH OIL SKIMMERS & HAUL TO LANDFILL						1000	
	FLUSH SUMP & PUMPS						2500	
	EXCAVATE SLUDGE - BLENDING WITH							
	2/1 VOLUME OF DREDGE SPOIL							
	DREDGE SPOIL BROUGHT IN	7616	CY			1st	12500	
	BLENDING OF SLUDGE & DREDGE SPOIL							
	REMOVAL OF SLUDGE/DREDGE SPOIL MIXTURE	11424	CY			2nd	24000	
	DEWATER PONDS						3500	
	USE PORTABLE PUMPS (3)							
			SUBTOTAL DASE LABOR					
	SUBTOTAL		MH FACTOR					
	TOTAL		$ RATE					

T-78-

ENGINEERING DEPARTMENT
UNION CARBIDE CORPORATION
CHEMICALS AND PLASTICS

TITLE EQUALIZATION PONDS
PONCE
PART I

SHEET NO. 2-7
LOCATION 293

DATE 3/
REQUEST

DESCRIPTION	QUANTITY	UNIT	LABOR MANHOURS UNIT	LABOR MANHOURS TOTAL	MATERIAL UNIT $	MATERIAL TOTAL $	TOTAL COST $
EXCAVATE CONCRETE LINER & HAUL TO LAND FILL	534	CY			34.40	18400	
TESTING: SOIL SAMPLES	6	EA				6000	
EXCAVATE CONTAMINATED SOIL & HAUL TO LAND FILL	7382	CY			2.10	15500	
LAND FILL MAT'LS IN N.W. LANDFILL SPREADING, COMPACTING, & COVERING	9340	CY			1.25	24200	
6' FENCE SURROUNDING EQUALIZATION PONDS	1000	LF			9.00	9000	
CONTINGENCY CLOSURE - B/F BOTH BASINS & COMPACT WITH 2' OF CALICHE	5000	CY			3.50	17500	
RESEED BOTH BASINS WITH GRASS	66000	SF			0.32	21100	
				SUBTOTAL BASE LABOR			
SUBTOTAL				MH FACTOR		161,100	161,10
TOTAL				$ RATE		~~113500~~	~~113-5~~

-6-I

ENGINEERING DEPARTMENT
UNION CARBIDE CORPORATION
CHEMICALS AND PLASTICS
ESTIMATE – LABOR AND MATERIAL

TITLE	SHEET NO.	DATE
EQUALIZATION PONDS PONCE PART I	3 of 7	3/ /
	LOCATION 293	REQUEST
CLERK / TECHNICIAN / COST ENGR. JBC	WORK ORDER	ACCOUNT

ITEM NUMBER	DESCRIPTION	QUANTITY	UNIT	LABOR MANHOURS UNIT	LABOR MANHOURS TOTAL	MATERIAL UNIT $	MATERIAL TOTAL $	TOTAL COST $
	EQUIPMENT REMOVAL							
	SURFACE AERATORS	4	EA				11900	
	INCLUDES USE OF CRANE							
	BOAT RAMP						3100	
	CLEANING EQUIPMENT BY HYDRO BLASTING						2000	
	FLUSH WATER TO AERATION BASIN #1							
	DEMOLISH RAMP & HAUL TO LAND FILL						1000	
	DEWATER POND							
	USE PORTABLE PUMPS (3)						3500	
	EXCAVATE SLUDGE - BLENDING WITH							
	2/1 VOLUME OF DREDGE SPOIL							
	DREDGE SPOIL BROUGHT IN	3760	CY			1st	6200	
	BLENDING OF SLUDGE & DREDGE SPOIL							
	REMOVAL OF SLUDGE/DREDGE SPOIL MIXTURE	5740	CY			2nd	12100	
				SUBTOTAL BASE LABOR				
	SUBTOTAL			MH FACTOR				
	TOTAL			$ RATE				

T-80-

ENGINEERING DEPARTMENT
UNION CARBIDE CORPORATION
CHEMICALS AND PLASTICS
ESTIMATE - LABOR AND MATERIAL

TITLE	SHEET NO.	DATE
AERATION BASIN #2 PONCE PART II	4 of 7	3/ /
	LOCATION 293	REQUEST
CLERK / TECHNICIAN / COST ENGR. TRC	WORK ORDER	ACCOUNT

ITEM NUMBER	DESCRIPTION	QUANTITY	UNIT	LABOR MANHOURS UNIT	LABOR MANHOURS TOTAL	MATERIAL UNIT $	MATERIAL TOTAL $	TOTAL COST $
	EXCAVATE RIP RAP & CONCRETE LINER							
	& HAUL TO LANDFILL							
	RIP RAP	1943	CY			4.50	8700	
	CONCRETE LINER	218	—			34.40	7500	
	TESTING: SOIL SAMPLES	3	EA				3000	
	EXCAVATE CONTAMINATED SOIL	5008	CY			2.10	10500	
	LANDFILL MAT'LS IN N.W. LANDFILL	1294	CY			1.25	16200	
	SPREADING, COMPACTING, & COVERING							
	6' FENCE SURROUNDING #2 BASIN	500	LF			9.00	4500	
	CONTINGENCY CLOSURE - B/F & COMPACT	5000	SY			3.50	17500	
	2' OF CALICHE IN BASIN							
	RESEED BASIN WITH GRASS	6750	SY			0.32	21,600	
					SUBTOTAL BASE LABOR			
	SUBTOTAL				MI FACTOR		129,300	129,300
	TOTAL				$ RATE		~~$5700~~	~~$5700~~

-I-81-

ENGINEERING DEPARTMENT
UNION CARBIDE CORPORATION
CHEMICALS AND PLASTICS
ESTIMATE - LABOR AND MATERIAL

TITLE: AERATION BASIN #2
PONCE
PART II

SHEET NO. 5-7
DATE 3/
LOCATION 293
REQUEST
WORK ORDER
ACCOUNT

CLERK | TECHNICIAN | COST ENGR.

ITEM NUMBER	DESCRIPTION	QUANTITY	UNIT	LABOR MANHOURS UNIT	LABOR MANHOURS TOTAL	MATERIAL UNIT $	MATERIAL TOTAL $	TOTAL COST $
	RACK PIPE							
	1B2 10" ∅	225	LF			14.66	3300	
	FITTINGS						3300	
	HANGERS & SUPPORTS	850	lbs			2.00	1700	
	BOLTS & GASKETS	35	EA			35.00	1300	
	MISC MAT'L						200	
	ERRECTION : RACK PIPE							
	1B2 10" ∅	225					1700	
	TIE-INS : TO EXISTING LINES						800	
	SITE FABRICATION : RACK PIPE						1000	
	UNDER GROUND PIPE							
	68W2 10" ∅	275	LF				1600	
	EXCAVATION						400	
	BACK FILL						200	
	MISC MAT'L						400	
				SUBTOTAL				
				BASE LABOR				
	SUBTOTAL			MH FACTOR				
	TOTAL			$ RATE				

I-82-

ENGINEERING DEPARTMENT
UNION CARBIDE CORPORATION
CHEMICALS AND PLASTICS

TITLE CONVERT TO EXTENDED ATMTION
PONCE
PART III

SHEET NO. 6-7
LOCATION 293

DATE 3/1/
REQUEST NO

ITEM NUMBER	DESCRIPTION	QUANTITY	UNIT	LABOR MANHOURS UNIT	LABOR MANHOURS TOTAL	MATERIAL UNIT $	MATERIAL TOTAL $	TOTAL COST $
	FAB. TESTING : 10% OF FABRICATION						100	
	TESTING & CLEANING						400	
	UNLOAD & SHAKEOUT						300	
			SUBTOTAL BASE LABOR					
	SUBTOTAL		MH FACTOR					
	TOTAL		$ RATE				16700	16700

I-83-

ENGINEERING DEPARTMENT
UNION CARBIDE CORPORATION
CHEMICALS AND PLASTICS

TITLE CONVERT TO EXTENDED AERATION PONCE PART III

SHEET NO. 7-7
LOCATION 293
DATE 3/18
REQUEST NO

ESTIMATE - LABOR AND MATERIAL | CLERK | TECHNICIAN | COST ENGR. | WORK ORDER | ACCOUNT

UNION CARBIDE

ACCT	DESCRIPTION	MAN HOURS	DOLLARS IN THOUSANDS			
			LABOR	SUB-CONTRACT	MATERIAL	TOTAL
0-5xxxx 7xxxx	Summary: Direct Labor and Materials		—	350.3	—	350.3
6xxxx	Summary: Indirect Labor and Materials		—	—	—	—
	Sub-Total					350.3
	Site Administration: % of Direct labor					—
	Subcontract Overhead: 5% of S/C					17.7
	Sub-Total					368.0
8067	ENGINEERING: In-house 10% of S/T					37.0
068	Contract					
	Sub-Total					405.0
9999	Contingencies (Note 1): 25% of S/T					105
	TOTAL ESTIMATE (* 1981 Costs) (**1983 Cost @ 7%/year inflation)					*510.0 **580.0

NOTES: 1. Contingencies are allowances for undefined and unforeseeable deviations from the ideal progress of the job. Examples of items which may be covered by contingencies are the costs caused by: Unforeseen field changes within original project scope, Construction problems, Strikes, Delays in material delivery, Force majeure, etc. Changes in scope are specifically excluded.

ENGINEERING DEPARTMENT
UNION CARBIDE CORPORATION
CENTRAL ENGINEERING/HYDROCARBONS

CRAIG WILDER
X 3707
Mc 1981

TITLE: PRIMARY SOLIDS PONDS REMOVAL
PONCE

LOCATION	COST ENGINEER	REQUEST NO.	DATE
293	JBC/WPI	—	11/21/83
ESTIMATE TYPE		SHEET NO.	ORDER NO.
± 25% STUDY		1/3	930-

ESTIMATE SUMMARY

COE-108

ITEM NUMBER	DESCRIPTION	QUANTITY	UNIT	LABOR MANHOURS UNIT	LABOR MANHOURS TOTAL	MATERIAL UNIT $	MATERIAL TOTAL $	TOTAL COST $
	REMOVE WATER FROM PONDS USING							
	TANK TRUCKS (2) (INCLUDES OPERATORS)						5000	
	PUMPS (2)						1600	
	APPROX. 913,000 GALLONS							
	EXCAVATE SOLIDS — BLENDING WITH							
	1/1 VOLUME OF DREDGE SPOIL							
	DREDGE SPOIL BROUGHT IN	22600	CY			1.64	37000	PROVIDED B
	INCLUDES LOADING, HAULING & DUMPING							FRAN FOELL
	BLENDING OF SOLIDS & DREDGE SOIL							1980 QUOT
	INCLUDES DOZERS (BLADE & LOADER TYPE)							120000 x 1.1 =
	REMOVAL OF SOLIDS/DREDGE SOIL MIXTURE	45200	CY			2.10	95000	132000
	INCLUDES LOADING INTO TRUCKS, HAUL,							37000 + 95000 = 13
	UNLOAD, & SPREAD							
	BLEND IN MORE DREDGE SPOIL TO BRING							
	DREDGE SPOIL/SLUDGE RATIO TO 2/1							
	DREDGE SPOIL BROUGHT IN	22600	CY			1.64	37000	
	INCLUDES LOADING, HAULING, & DUMPING							
	BLENDING OF MIXTURE							
				SUBTOTAL BASE LABOR				
	SUBTOTAL			MH FACTOR				
	TOTAL			$ RATE				

ENGINEERING DEPARTMENT
UNION CARBIDE CORPORATION
CHEMICALS AND PLASTICS

TITLE PRIMARY SOLIDS PONDS REMOVAL
PONCE

SHEET NO. 2-3
LOCATION 293

DATE 3/17/
REQUEST NO

ITEM NUMBER	DESCRIPTION	QUANTITY	UNIT	LABOR MANHOURS UNIT	LABOR MANHOURS TOTAL	MATERIAL UNIT $	MATERIAL TOTAL $	TOTAL COST $
	MOVE SOLIDS/DREDGE SPOIL TO APPROPIATE PLACE IN LANDFILL INCLUDES SPREAD, COMPACT & COVER	67800	CY			1.25	84800	
	TESTING: SOIL SAMPLES	4	EA				4000	
	REMOVE CONTAMINATED PART OF DIKE INCLUDES LOAD, HAUL, SPREAD, & COMPACT	140	CY				1500	
	COLLAPSE REMAINING DIKE WALLS & COMPACT INTO EVEN MOUNDS	8982	CY				18000	
	REMOVE 3' OF CONTAMINATED SOIL UNDER PSP's TO INDUSTRIAL LANDFILL	14000	CY			2.10	29400	
	APPLY 2' CALICHE/BENTONITE CAP TO PSP's AREA & GRADE TO BAY	10,000	CY			3.70	37000	
			SUBTOTAL BASE LABOR					
	SUBTOTAL		MH FACTOR				350,300	350,300
	TOTAL		$ RATE				~~283,900~~	~~283,900~~

I-86-

ENGINEERING DEPARTMENT
UNION CARBIDE CORPORATION
CHEMICALS AND PLASTICS
ESTIMATE - LABOR AND MATERIAL

TITLE PRIMARY SOLIDS PONDS REMOVAL
PONCE

SHEET NO. 3-3
LOCATION 293
DATE 3/17/8
REQUEST NO.

CLERK | TECHNICIAN | COST ENGR. | WORK ORDER | ACCOUNT

UNION CARBIDE

ACCT	DESCRIPTION	MAN HOURS	DOLLARS IN THOUSANDS			
			LABOR	SUB-CONTRACT	MATERIAL	TOTAL
0-5xxxx 7xxxx	Summary: Direct Labor and Materials	—	—	775.3	—	775.3
6xxxx	Summary: Indirect Labor and Materials	—	—	—	—	—
	Sub-Total					775.3
	Site Administration: % of Direct labor					
	Subcontract Overhead: 5 % of S/C					38.7
	Sub-Total					814.0
8067	ENGINEERING: In-house 10% of S/T					81.0
8068	Contract					
	Sub-Total					895.0
9999	Contingencies (Note 1): 25% of S/T					225.0
	TOTAL ESTIMATE (* 1981 Cost Estimate) (** 1983 Estimate escalated at 7%/yr)					* 1120.0 ** 1280.0

NOTES: 1. Contingencies are allowances for undefined and unforeseeable deviations from the ideal progress of the job. Examples of items which may be covered by contingencies are the costs caused by: Unforeseen field changes within original project scope, Construction problems, Strikes, Delays in material delivery, Force majeure, etc. Changes in scope are specifically excluded.

ENGINEERING DEPARTMENT
UNION CARBIDE CORPORATION
CENTRAL ENGINEERING/HYDROCARBONS

CRAIG WILGER
x 3707
MC 1981

ESTIMATE SUMMARY

COE-108

TITLE			
CLOSURE COST INDUSTRIAL LANDFILL PONCE			
LOCATION	COST ENGINEER	REQUEST NO.	DATE
293	WPI	—	11/22/83
ESTIMATE TYPE		SHEET NO.	ORDER NO.
I 25% STUDY		1 — 2	930-

ITEM NUMBER	DESCRIPTION	QUANTITY	UNIT	LABOR MANHOURS UNIT	LABOR MANHOURS TOTAL	MATERIAL UNIT $	MATERIAL TOTAL $	TOTAL COST $
	CLOSE CELLS # 1, 2, 3 LANDFILL							
	COVER LANDFILL w/ CALICHE - BENTONITE MIXTURE							
	CALICHE	54,250	cy			2.10	113,900	
	BENTONITE	2850	✓			8.25	23,500	
	BLEND CALICHE - BENTONITE	57,100	✓			.21	12,000	
	SPREAD & COMPACT	57,100	✓			1.25	71,400	
	COVER LANDFILL w/ 3" of SAND	9000	✓			2.00	18000	
	" " " 6" of TOPSOIL	18,000	✓			2.25	40,500	
	SPREAD GRASS SEED OVER ENTIRE AREA	1,000,000	SF			.30	300,000	
	CLOSE STORMWATER POND							
	REMOVE CONTAMINATED STORMWATER (USING PUMPS)	150,000	GAL				1000	
	TRANSPORTATION COST	150,000	GAL				2300	
	TREATING STORMWATER IN OFF-SITE FACILITY	150,000	GAL			.05	7500	
	STORM PUMPS: REMOVE & FLUSH	2	ea				300	
	STORM WATER DITCH REVISIONS							
	NEW DITCH - EXCAVATION & BACKFILL	300	cy			4.57	3700	
	CONCRETE	200	✓			200	40,000	
	EXISTING DITCH - EXCAVATION & BACKFILL	660	✓			1.57	3100	
	CONCRETE	660	✓			200	132,000	
	CONCRETE ELLIPTICAL PIPE w/ FITTINGS 27" x 48"	100	LF			56.00	5600	
				SUBTOTAL BASE LABOR				
	SUBTOTAL			MH FACTOR				
	TOTAL			$ RATE	—		775,300	

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ENGINEERING DEPARTMENT
UNION CARBIDE CORPORATION
CHEMICALS AND PLASTICS

TITLE: CLOSURE COST ESTIMATE
INDUSTRIAL LANDFILL

SHEET NO. 2-2
LOCATION 293
DATE 11/22/85
REQUEST NO. —

ACCT	DESCRIPTION	ESTIMATE BASIS	DIRECT MAN HOURS	DOLLARS			
				DIRECT LABOR	SUBCONTRACTS	MATERIAL	TOTAL
04002	SUBTOTAL - DIRECT LABOR AND MATERIAL		—	—	16300	—	16300
09705	O.H. FIXED PRICE CONST. CONTRACT	10% X FIXED PRICE			1600		1600
6999	LABOR BURDEN (NOTE 1)						
09095	LOCATION OVERHEAD (NOTE 2)						
9900	GENERAL ADMINISTRATION OVERHEAD (NOTE 3)						
	SUB-TOTAL						17900
8066	DEFINITION OF FACILITIES - ENGINEERING (NOTE 4)						
08067	POST CBP ENGINEERING - UCC (NOTE 5)	6 % X S/T					1100
8068	POST CBP ENGINEERING - CONTRACTOR (NOTE 5)						
8069	STARTUP ENGINEERING (NOTE 6)						
8070	COMPUTER PROGRAMMING						
	SUBTOTAL - DIRECT AND INDIRECT COSTS						19000
09999	CONTINGENCIES (NOTE 7)	21 % X S/T					4000
	TOTAL ESTIMATE						23000
	UNASSIGNED FUNDS, 5%						
	TOTAL BUDGET AUTHORIZATION					#	23000

NOTES:
1. LABOR BURDEN INCLUDES EMPLOYER'S CONTRIBUTION TO FICA, WORKMEN'S COMPENSATION, OTHER PAYROLL TAXES AND INSURANCE, "SHOWUP" PAY, CRAFT TRAVEL, CRAFT FRINGE BENEFITS, HOLIDAY PAY, AND OTHER UNION FRINGES, AS APPLICABLE TO FIELD LABOR.
2. LOCATION OVERHEAD INCLUDES INDIRECT COSTS INCURRED BY UCC AND THE CONTRACTOR (IF APPLICABLE) AT THE FIELD LOCATION INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING ACTIVITIES: GENERAL SUPERVISION, CRAFT SUPERVISION, TIME KEEPING, FIELD PURCHASING, FIELD ACCOUNTING, WAREHOUSING AND MATERIAL CONTROL, TEMPORARY BUILDINGS, TEMPORARY UTILITIES, AND UNALLOCABLE CONSTRUCTION LABOR SUCH AS WELDER QUALIFICATION, WATCHMEN, JANITORS, ETC.
3. GENERAL ADMINISTRATION OVERHEAD INCLUDES ENGINEERING DEPARTMENT CONSTRUCTION MANAGEMENT NOT ASSIGNABLE TO SPECIFIC LOCATION, AND OTHER CONSTRUCTION AND INSPECTION COSTS WHICH CANNOT BE ASSIGNED TO A SPECIFIC PROJECT OR SPECIFIC LOCATION.
4. DEFINITION OF FACILITIES ENGINEERING IS THE COST OF PRELIMINARY ENGINEERING REQUIRED TO COMPLETELY DEFINE THE FACILITIES AND PREPARE AN APPROPRIATION QUALITY ESTIMATE OF COST.
5. POST-CBP ENGINEERING INCLUDES THE COST OF BOTH UCC AND CONTRACT ENGINEERING FROM COMPLETION OF THE DOF THROUGH PHYSICAL COMPLETION OF THE PROJECT.
6. STARTUP ENGINEERING INCLUDES THE CAPITALIZABLE COST OF THE ENGINEERING SERVICES FROM PHYSICAL COMPLETION THROUGH SUCCESSFUL OPERATION OF THE PROJECT AS DEFINED IN THE DOF REPORT.
7. CONTINGENCIES ARE ALLOWANCES FOR UNDEFINED AND UNFORESEEABLE DEVIATIONS FROM THE IDEAL PROCESS OF THE JOB. EXAMPLES OF ITEMS WHICH MAY BE COVERED BY CONTINGENCIES ARE THE COSTS CAUSED BY: UNFORESEEN FIELD CHANGES WITHIN ORIGINAL PROJECT SCOPE, CONSTRUCTION PROBLEMS, STRIKES, DELAYS IN MATERIAL DELIVERY, FORCE MAJEURE, ETC. CHANGES IN SCOPE ARE SPECIFICALLY EXCLUDED.

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ENGINEERING DEPARTMENT
Union Carbide Caribe Inc.
Ethylene Oxide Glycol Division
ESTIMATE SUMMARY CONST. BY OUTSIDER
P-23-25-A ENG. JEANETTE L. ESCABI'

TITLE ES STORAGE TANKS CLOSURE		SHEET NO. 1-3	DATE 12/6/83
[redacted]		LOCATION 293	REQUEST NO 933-01597
ESTIMATE TYPE ±25% Mc2Q84 REF. NO. 8313614		COST ~~ENGINEER~~ A. VAZQUEZ	ORDER NO

ACCT	DESCRIPTION	ESTIMATE BASIS	DIRECT MAN HOURS	DOLLARS			
				DIRECT LABOR	SUBCONTRACTS	MATERIAL	TOTAL
34002	FIXED PRICE CONST. CONTRACT:		—	—	9000	—	
	MAJOR EQUIP. & MACH. (CLEANING CLOSURE)						
	CONST. EQUIP. & OPERATORS		—	—	5000	—	
	TEMP. CONST. FACILITIES		—	—	1000	—	
	SCAFFOLDING		—	—	500	—	
	JOB CLEAN-UP		—	—	500	—	
	TOOLROOM & WAREHOUSE		—	—	300	—	
SUBTOTALS			—	—	16300	—	16300

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ENGINEERING DEPARTMENT
Union Carbide Caribe Inc.
Ethylene Oxide Glycol Division

ESTIMATE SUMMARY
P-23-25-B

TITLE E S STORAGE TANKS CLOSURE (TANKS - 473, 474 & 480).		SHEET NO. 2-3	DATE 12/6/83
		LOCATION 293	REQUEST NO. 933-0159-
ESTIMATE TYPE ±25% MC 2084 REF. NO. 8313614		COST ENGINEER A. VAZQUEZ	ORDER NO

ITEM NUMBER	DESCRIPTION	QUANTITY	UNIT	LABOR MANHOURS UNIT	LABOR MANHOURS TOTAL	MATERIAL UNIT $	MATERIAL TOTAL $	TOTAL COST $
04002	MAJOR EQUIP. & MACH. (CLEANING & CLOSURE)							
	TANK-473 (10,000 GAL'S.) W/PIPE LINES	1	EA	—	80	—	—	
	TANK-474 (10,000 GAL'S.) "	1	EA	—	80	—	—	
	TANK-480 (32,500 GAL'S.) "	1	EA	—	200	—	—	
					~~			
					360			
	ALL WASTES TRANSFER TO EP RESIDUES TANKS OR BURNED IN BOILER. HYDROBLAST TANKS WALLS & FLUSH W/WATER ALL TANKS, PUMPS & PIPE LINES							
	NITROGEN PURGE TO PUMPS & RELATED INLET & OUTLET PIPE LINES	ALLOW	—	—	48	—	—	
	ALL WASTEWATER GENERATED FROM ABOVE ACTIVITIES GO TO PROCESS SEWER							
	HAUL & HANDLING	ALLOW	—	—	24	—	—	
	MISC. MATERIAL & UNLISTED	ALLOW	—	—	40	—	500	
			SUBTOTAL BASE LABOR		472			
	SUBTOTAL		MH FACTOR 1.0		472			
	TOTAL		$ RATE 18.00		8500		500	9000

ENGINEERING DEPARTMENT
Union Carbide Caribe Inc.
Oxide Glycol Division
ESTIMATE – LABOR AND MATERIAL P-23-25C

TITLE E5 STORAGE TANKS CLOSURE (TANKS-473, 474 & 480) REF. NO. 8313614				SHEET NO. 3-3	DATE 12/6/83
				LOCATION 293	REQUEST NO. 733-01595
± 25% M C 2Q84	CLERK	TECHNICIAN	COST ENGR A. VAZQUEZ	WORK ORDER	ACCOUNT 04002

ACCT	DESCRIPTION	ESTIMATE BASIS	DIRECT MAN HOURS	DOLLARS			
				DIRECT LABOR	SUBCONTRACTS	MATERIAL	TOTAL
	SUBTOTAL - DIRECT LABOR AND MATERIAL		468	14000	—	900	14900
6999	LABOR BURDEN (NOTE 1)						
09685	LOCATION OVERHEAD (NOTE 2)	INCLUDED W/MH RATE					
9900	GENERAL ADMINISTRATION OVERHEAD (NOTE 3)						~~~
	SUB-TOTAL						14900
8066	DEFINITION OF FACILITIES - ENGINEERING (NOTE 4)						
08067	POST CBP ENGINEERING - UCC (NOTE 5)	9% X S/T					1300
8068	POST CBP ENGINEERING - CONTRACTOR (NOTE 5)						
8069	STARTUP ENGINEERING (NOTE 6)						
8070	COMPUTER PROGRAMMING						~~~
	SUBTOTAL - DIRECT AND INDIRECT COSTS						16200
09993	CONTINGENCIES (NOTE 7)	23% X S/T					3800
	TOTAL ESTIMATE						20000
	UNASSIGNED FUNDS, %						
	TOTAL BUDGET AUTHORIZATION					$	20000

NOTES:
1. LABOR BURDEN INCLUDES EMPLOYER'S CONTRIBUTION TO FICA, WORKMEN'S COMPENSATION, OTHER PAYROLL TAXES AND INSURANCE, "SHOWUP" PAY, CRAFT TRAVEL, CRAFT FRINGE BENEFITS, HOLIDAY PAY, AND OTHER UNION FRINGES, AS APPLICABLE TO FIELD LABOR.
2. LOCATION OVERHEAD INCLUDES INDIRECT COSTS INCURRED BY UCC AND THE CONTRACTOR (IF APPLICABLE) AT THE FIELD LOCATION INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING ACTIVITIES: GENERAL SUPERVISION, CRAFT SUPERVISION, TIME KEEPING, FIELD PURCHASING, FIELD ACCOUNTING, WAREHOUSING AND MATERIAL CONTROL, TEMPORARY BUILDINGS, TEMPORARY UTILITIES, AND UNALLOCABLE CONSTRUCTION LABOR SUCH AS WELDER QUALIFICATION, WATCHMEN, JANITORS, ETC.
3. GENERAL ADMINISTRATION OVERHEAD INCLUDES ENGINEERING DEPARTMENT CONSTRUCTION MANAGEMENT NOT ASSIGNABLE TO SPECIFIC LOCATION, AND OTHER CONSTRUCTION AND INSPECTION COSTS WHICH CANNOT BE ASSIGNED TO A SPECIFIC PROJECT OR SPECIFIC LOCATION.
4. DEFINITION OF FACILITIES ENGINEERING IS THE COST OF PRELIMINARY ENGINEERING REQUIRED TO COMPLETELY DEFINE THE FACILITIES AND PREPARE AN APPROPRIATION QUALITY ESTIMATE OF COST.
5. POST-CBP ENGINEERING INCLUDES THE COST OF BOTH UCC AND CONTRACT ENGINEERING FROM COMPLETION OF THE DDF THROUGH PHYSICAL COMPLETION OF THE PROJECT.
6. STARTUP ENGINEERING INCLUDES THE CAPITALIZABLE COST OF THE ENGINEERING SERVICES FROM PHYSICAL COMPLETION THROUGH SUCCESSFUL OPERATION OF THE PROJECT AS DEFINED IN THE DDF REPORT.
7. CONTINGENCIES ARE ALLOWANCES FOR UNDEFINED AND UNFORESEEABLE DEVIATIONS FROM THE IDEAL PROCESS OF THE JOB. EXAMPLES OF ITEMS WHICH MAY BE COVERED BY CONTINGENCIES ARE THE COSTS CAUSED BY: UNFORESEEN FIELD CHANGES WITHIN ORIGINAL PROJECT SCOPE, CONSTRUCTION PROBLEMS, STRIKES, DELAYS IN MATERIAL DELIVERY, FORCE MAJEURE, ETC. CHANGES IN SCOPE ARE SPECIFICALLY EXCLUDED.

ENGINEERING DEPARTMENT
Union Carbide Caribe Inc.
Ethylene Oxide Glycol Division
ESTIMATE SUMMARY CONST. BY MAINT.,
P-23-25-A ENG. JEANETTE L. ESCABI

TITLE EP STORAGE TANKS CLOSURE		SHEET NO 1-3	DATE 12/6/83
~~TANKS 1004, 1002 & 1010~~		LOCATION 293	REQUEST NO #38-0159
ESTIMATE TYPE ±25%	MC2Q84 REF. NO. 8313614	COST ENGINEER A. VAZQUEZ	ORDER NO EXPENSE

ACCT	DESCRIPTION	ESTIMATE BASIS	DIRECT MAN HOURS	DOLLARS			
				DIRECT LABOR	SUBCONTRACTS	MATERIAL	TOTAL
05100	MAJOR EQUIP. & MACH. (CLEANING CLOSURE)		371	11100	—	200	11300
07000	CONST. EQUIP. & OPERATORS		40	1200	—	300	1500
07010	TEMP. CONST. FACILITIES		20	600	—	200	800
07020	SCAFFOLDING		10	300	—	200	500
07030	JOB CLEAN-UP		17	500	—	—	500
07040	TOOLROOM & WAREHOUSE		10	300	—	—	300
SUBTOTALS			468	14000	—	900	14900

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ENGINEERING DEPARTMENT
Union Carbide Caribe Inc.
Ethylene Oxide Glycol Division

ESTIMATE SUMMARY
P-23-25-B

TITLE EP STORAGE TANKS CLOSURE (TANKS-1001, 1002 & 1010)	SHEET NO. 2-3	DATE 12/6/8
	LOCATION 273	REQUEST NO. 933-015
ESTIMATE TYPE	COST ENGINEER A. VAZQUEZ	ORDER NO. EXPEN

ITEM NUMBER	DESCRIPTION	QUANTITY	UNIT	LABOR MANHOURS UNIT	LABOR MANHOURS TOTAL	MATERIAL UNIT $	MATERIAL TOTAL $	TOTAL COST $
05100	MAJOR EQUIPMENT & MACH. (CLEANING & CLOSURE)							
	TANK-1001 (5000 GAL's.) W/PIPE LINES	1	EA	—	40	—	—	
	TANK-1002 (10000 GAL's.) "	1	EA	—	80	—	—	
	TANK-1010 (1000 GAL's.) "	.1	EA	—	80	—	—	
					~~			
					200			
	ALL WASTES PUMPED-OUT. CLEAN ALL TANKS & PIPE LINES WITH STEAM AND WATER FLUSH PROCEDURE.							
	HAUL & HANDLING	ALLOW	—	—	12	—	—	
	MISC. MATERIAL & UNLISTED	ALLOW	—	—	20	—	200	
			SUBTOTAL BASE LABOR		232			
	SUBTOTAL		MH FACTOR 1.6		371			
	TOTAL		$ RATE 30.00		11100		200	11300

ENGINEERING DEPARTMENT
Union Carbide Caribe Inc.
Oxide Glycol Division
ESTIMATE – LABOR AND MATERIAL P-23-25C

TITLE EP STORAGE TANKS CLOSURE (TANKS-1001, 1002 & 1010) REF. NO. 8313614				SHEET NO. 3-3	DATE 12/5/8
				LOCATION 293	REQUEST NO. 938-015
±25% Mc 2084	CLERK	TECHNICIAN	COST ~~ENGR.~~ A. VAZQUEZ	WORK ORDER EXPENSE	ACCOUNT 05100

ACCT	DESCRIPTION	ESTIMATE BASIS	DIRECT MAN HOURS	DOLLARS			
				DIRECT LABOR	SUBCONTRACTS	MATERIAL	TOTAL
04001	SUBTOTAL - DIRECT LABOR AND MATERIAL		—	—	10300	—	10300
09705	O.H. FIXED PRICE CONST. CONTRACT	10% X FIXED PRICE			1000		1000
6999	LABOR BURDEN (NOTE 1)						
09605	LOCATION OVERHEAD (NOTE 2)						
9900	GENERAL ADMINISTRATION OVERHEAD (NOTE 3)						
	SUB-TOTAL						11300
8066	DEFINITION OF FACILITIES - ENGINEERING (NOTE 4)						
08067	POST CBP ENGINEERING - UCC (NOTE 5)	10 % X S/T					1100
8068	POST CBP ENGINEERING - CONTRACTOR (NOTE 5)						
8069	STARTUP ENGINEERING (NOTE 6)						
8070	COMPUTER PROGRAMMING						
	SUBTOTAL - DIRECT AND INDIRECT COSTS						12400
09999	CONTINGENCIES (NOTE 7)	21 % X S/T					2600
	TOTAL ESTIMATE						15000
	UNASSIGNED FUNDS, 5%						
	TOTAL BUDGET AUTHORIZATION					#5	15000

NOTES:
1. LABOR BURDEN INCLUDES EMPLOYER'S CONTRIBUTION TO FICA, WORKMEN'S COMPENSATION, OTHER PAYROLL TAXES AND INSURANCE, "SHOWUP" PAY, CRAFT TRAVEL, CRAFT FRINGE BENEFITS, HOLIDAY PAY, AND OTHER UNION FRINGES, AS APPLICABLE TO FIELD LABOR.
2. LOCATION OVERHEAD INCLUDES INDIRECT COSTS INCURRED BY UCC AND THE CONTRACTOR (IF APPLICABLE) AT THE FIELD LOCATION INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING ACTIVITIES: GENERAL SUPERVISION, CRAFT SUPERVISION, TIME KEEPING, FIELD PURCHASING, FIELD ACCOUNTING, WAREHOUSING AND MATERIAL CONTROL, TEMPORARY BUILDINGS, TEMPORARY UTILITIES, AND UNALLOCABLE CONSTRUCTION LABOR SUCH AS WELDER QUALIFICATION, WATCHMEN, JANITORS, ETC.
3. GENERAL ADMINISTRATION OVERHEAD INCLUDES ENGINEERING DEPARTMENT CONSTRUCTION MANAGEMENT NOT ASSIGNABLE TO SPECIFIC LOCATION, AND OTHER CONSTRUCTION AND INSPECTION COSTS WHICH CANNOT BE ASSIGNED TO A SPECIFIC PROJECT OR SPECIFIC LOCATION.
4. DEFINITION OF FACILITIES ENGINEERING IS THE COST OF PRELIMINARY ENGINEERING REQUIRED TO COMPLETELY DEFINE THE FACILITIES AND PREPARE AN APPROPRIATION QUALITY ESTIMATE OF COST.
5. POST-CBP ENGINEERING INCLUDES THE COST OF BOTH UCC AND CONTRACT ENGINEERING FROM COMPLETION OF THE DOF THROUGH PHYSICAL COMPLETION OF THE PROJECT.
6. STARTUP ENGINEERING INCLUDES THE CAPITALIZABLE COST OF THE ENGINEERING SERVICES FROM PHYSICAL COMPLETION THROUGH SUCCESSFUL OPERATION OF THE PROJECT AS DEFINED IN THE DOF REPORT.
7. CONTINGENCIES ARE ALLOWANCES FOR UNDEFINED AND UNFORESEEABLE DEVIATIONS FROM THE IDEAL PROCESS OF THE JOB. EXAMPLES OF ITEMS WHICH MAY BE COVERED BY CONTINGENCIES ARE THE COSTS CAUSED BY: UNFORESEEN FIELD CHANGES WITHIN ORIGINAL PROJECT SCOPE, CONSTRUCTION PROBLEMS, STRIKES, DELAYS IN MATERIAL DELIVERY, FORCE MAJEURE, ETC. CHANGES IN SCOPE ARE SPECIFICALLY EXCLUDED.

ENGINEERING DEPARTMENT
Union Carbide Caribe Inc.
Ethylene Oxide Glycol Division
ESTIMATE SUMMARY CONST. BY OUTSIDER

TITLE PHENOL ACETONE STORAGE TANKS		SHEET NO 1-3	DATE 12/6/83
[redacted] TANKS - 324 & 254)		LOCATION 293	REQUEST NO 938-01595
ESTIMATE TYPE ±25% MC2Q84 REF. NO. 8313614		COST ENGINEER A. VAZQUEZ	ORDER NO

ACCT	DESCRIPTION	ESTIMATE BASIS	DIRECT MAN HOURS	DOLLARS			
				DIRECT LABOR	SUBCONTRACTS	MATERIAL	TOTAL
04001	FIXED PRICE CONST. CONTRACT:		—	—	5500	—	
	MAJOR EQUIP. & MACH. (CLEANING CLOSURE	"					
		"					
		"					
		"					
	CONST. EQUIP. & OPERATORS		—	—	3000	—	
	TEMP. CONST. FACILITIES		—	—	800	—	
96-N	SCAFFOLDING		—	—	400	—	
	JOB CLEAN-UP		—	—	400	—	
	TOOLROOM & WAREHOUSE		—	—	200	—	
SUBTOTALS			—	—	10300	—	10300

ENGINEERING DEPARTMENT
Union Carbide Caribe Inc.
Ethylene Oxide Glycol Division

ESTIMATE SUMMARY

TITLE PHENOL ACETONE STORAGE TANKS		SHEET NO. 2-3	DATE 12/6/8
CLOSURE (TANKS - 324 & 754)		LOCATION 293	REQUEST NO. 938-015
ESTIMATE TYPE ± 25%	Mc 2Q84 REF. NO. 8313614	COST ENGINEER A. VAZQUEZ	ORDER NO.

ITEM NUMBER	DESCRIPTION	QUANTITY	UNIT	LABOR MANHOURS UNIT	LABOR MANHOURS TOTAL	MATERIAL UNIT $	MATERIAL TOTAL $	TOTAL COST $
	MAJOR EQUIP & MACH. (CLEANING, CLOSURE)							
	TANK-324 (17000 GAL's.) W/PIPE LINES	1	EA	—	70	—	—	
	TANK-754 (15000 GAL's.) "	1	EA	—	120	—	—	
					~~			
					190			
	ALL WASTES TRANSFER TO UTILITIES OR EP RESIDUES TANKS. HYDROBLAST TANKS WALLS & FLUSH W/WATER ALL TANKS, PUMPS & PIPE LINES.							
	NITROGEN PURGE TO PUMPS & RELATED INLET & OUTLET PIPE LINES	ALLOW	—	—	48	—	—	
	ALL WASTEWATER GENERATED FROM ABOVE ACTIVITIES GO TO PROCESS SEWER							
	HAUL & HANDLING	ALLOW	—	—	20	—	—	
	MISC. MATERIAL & UNLISTED	ALLOW	—	—	30	—	300	
			SUBTOTAL BASE LABOR		288			
	SUBTOTAL		MH FACTOR 1,8		288			
	TOTAL		$ RATE 18.50		5200		300	5500

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ENGINEERING DEPARTMENT
Union Carbide Caribe Inc.
Oxide Glycol Division
ESTIMATE – LABOR AND MATERIAL

P-23-25C

TITLE PHENOL ACETONE STORAGE TANKS CLOSURE (TANKS-324 & 754) REP. NO. 8313614				SHEET NO. 3-3	DATE 12/6/33
				LOCATION 293	REQUEST NO. 938-01575
±25% MC 2084	CLERK	TECHNICIAN	COST ENGR. A. VAZQUEZ	WORK ORDER	ACCOUNT 04001

ACCT	DESCRIPTION	ESTIMATE BASIS	DIRECT MAN HOURS	DOLLARS			
				DIRECT LABOR	SUBCONTRACTS	MATERIAL	TOTAL
	SUBTOTAL - DIRECT LABOR AND MATERIAL		974	29200	—	2700	31900
6999	LABOR BURDEN (NOTE 1)						
09605	LOCATION OVERHEAD (NOTE 2)	INCLUDED W/MH RATE					
9900	GENERAL ADMINISTRATION OVERHEAD (NOTE 3)						~~~
	SUB-TOTAL						31900
8066	DEFINITION OF FACILITIES - ENGINEERING (NOTE 4)						
08067	POST CBP ENGINEERING - UCC (NOTE 5)	10% X S/T					3100
8068	POST CBP ENGINEERING - CONTRACTOR (NOTE 5)						
8069	STARTUP ENGINEERING (NOTE 6)						
8070	COMPUTER PROGRAMMING						~~~
	SUBTOTAL - DIRECT AND INDIRECT COSTS						35000
09999	CONTINGENCIES (NOTE 7)	20% X S/T					7000
	TOTAL ESTIMATE						42000
	UNASSIGNED FUNDS, 0%						
	TOTAL BUDGET AUTHORIZATION					#	42000

NOTES:
1. LABOR BURDEN INCLUDES EMPLOYER'S CONTRIBUTION TO FICA, WORKMEN'S COMPENSATION, OTHER PAYROLL TAXES AND INSURANCE, "GHOSUP" PAY, CRAFT TRAVEL, CRAFT FRINGE BENEFITS, HOLIDAY PAY, AND OTHER UNION FRINGES, AS APPLICABLE TO FIELD LABOR.
2. LOCATION OVERHEAD INCLUDES INDIRECT COSTS INCURRED BY UCC AND THE CONTRACTOR (IF APPLICABLE) AT THE FIELD LOCATION INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING ACTIVITIES: GENERAL SUPERVISION, CRAFT SUPERVISION, TIME KEEPING, FIELD PURCHASING, FIELD ACCOUNTING, WAREHOUSING AND MATERIAL CONTROL, TEMPORARY BUILDINGS, TEMPORARY UTILITIES, AND UNALLOCABLE CONSTRUCTION LABOR SUCH AS WELDER QUALIFICATION, WATCHMEN, JANITORS, ETC.
3. GENERAL ADMINISTRATION OVERHEAD INCLUDES ENGINEERING DEPARTMENT CONSTRUCTION MANAGEMENT NOT ASSIGNABLE TO SPECIFIC LOCATION, AND OTHER CONSTRUCTION AND INSPECTION COSTS WHICH CANNOT BE ASSIGNED TO A SPECIFIC PROJECT OR SPECIFIC LOCATION.
4. DEFINITION OF FACILITIES ENGINEERING IS THE COST OF PRELIMINARY ENGINEERING REQUIRED TO COMPLETELY DEFINE THE FACILITIES AND PREPARE AN APPROPRIATION QUALITY ESTIMATE OF COST.
5. POST-CBP ENGINEERING INCLUDES THE COST OF BOTH UCC AND CONTRACT ENGINEERING FROM COMPLETION OF THE DOF THROUGH PHYSICAL COMPLETION OF THE PROJECT.
6. STARTUP ENGINEERING INCLUDES THE CAPITALIZABLE COST OF THE ENGINEERING SERVICES FROM PHYSICAL COMPLETION THROUGH SUCCESSFUL OPERATION OF THE PROJECT AS DEFINED IN THE DOF REPORT.
7. CONTINGENCIES ARE ALLOWANCES FOR UNDEFINED AND UNFORESEEABLE DEVIATIONS FROM THE IDEAL PROCESS OF THE JOB. EXAMPLES OF ITEMS WHICH MAY BE COVERED BY CONTINGENCIES ARE THE COSTS CAUSED BY: UNFORESEEN FIELD CHANGES WITHIN ORIGINAL PROJECT SCOPE, CONSTRUCTION PROBLEMS, STRIKES, DELAYS IN MATERIAL DELIVERY, FORCE MAJEURE, ETC. CHANGES IN SCOPE ARE SPECIFICALLY EXCLUDED.

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ENGINEERING DEPARTMENT
Union Carbide Caribe Inc.
Ethylene Oxide Glycol Division
ESTIMATE SUMMARY CONST. BY MAINT.
P 23 25-A ENG. JEANETTE L. ESCABI

TITLE DECONTAMINATION OF EP		SHEET NO. 1-3	DATE 12/1/83
~~FILTER PRESSES~~		LOCATION 293	REQUEST NO 738-0159
ESTIMATE TYPE ±25%	MC 2Q84 REF. NO. 8313614	COST ENGINEER A. VAZQUEZ	ORDER NO. EXPENSE

ACCT	DESCRIPTION	ESTIMATE BASIS	DIRECT MAN HOURS	DOLLARS			
				DIRECT LABOR	SUBCONTRACTS	MATERIAL	TOTAL
05100	MAJOR EQUIP. & MACH. (CLOSURE)		842	25250	—	1350	26600
07000	CONST. EQUIP. & OPERATORS		40	1200	—	1000	2200
07010	TEMP. CONST. FACILITIES		48	1450	—	250	1700
07020	SCAFFOLDING		17	500	—	100	600
07030	JOB CLEAN-UP		17	500	—	—	500
07040	TOOLROOM & WAREHOUSE		10	300	—	—	300
SUBTOTALS			974	29200	—	2700	31900

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ENGINEERING DEPARTMENT
Union Carbide Caribe Inc.
Ethylene Oxide Glycol Division

ESTIMATE SUMMARY

TITLE: DECONTAMINATION OF E.P. FILTER PRESSES

ESTIMATE TYPE: ± 25% MC 2Q84 REF. NO. 8313614

SHEET NO. 2-3

LOCATION 293

COST ENGINEER A. VAZQUEZ

DATE 12/1/83

REQUEST NO. 933-0159

ORDER NO. EXPENS

ITEM NUMBER	DESCRIPTION	QUANTITY	UNIT	LABOR MANHOURS UNIT	LABOR MANHOURS TOTAL	MATERIAL UNIT $	MATERIAL TOTAL $	TOTAL COST $
05100	MAJOR EQUIPMENT & MACHINERY (CLEANING CLOSURE)							
	CLEANING OF PIPE LINES (FILL SLUDGE CONDITIONING TANK WITH WATER, AGITATE THOROUGHLY & PUMP THIS WATER TO THE FILTER PRESSES)	ALLOW	—	—	48	—	100	
	REMOVE POLYPROPYLENE FILTER CLOTHS & DISPOSE THEM IN THE INDUSTRIAL LANDFILL	96	EA	1.4	134	—	—	
	HYDROBLAST FILTER PRESSES	ALLOW	—	—	—	—	700	
	REMOVE SLUDGE FROM HOPPER/HYDROBLAST	ALLOW	—	—	32	—	350	
	REMOVE FILTER PRESSES FOR SALVAGE	ALLOW	—	—	200	—	—	
					~~		~~~	
					414		1150	
	CLEAN-UP - 10%	ALLOW	—	—	24	—	—	
	HAUL & HANDLING - 10%	ALLOW	—	—	40	—	—	
	MISC. MATERIAL & UNLISTED	ALLOW	—	—	48	—	200	
			SUBTOTAL BASE LABOR		526			
	SUBTOTAL		MH FACTOR 1.6		3-42			
	TOTAL		$ RATE 30 35		35250	1350		26600

I-100-

ENGINEERING DEPARTMENT
Union Carbide Caribe Inc.
Oxide Glycol Division
ESTIMATE – LABOR AND MATERIAL

P-23-25C

TITLE DECONTAMINATION OF E.P. FILTER PRESSES REF. NO. 8313614				SHEET NO. 3-3	DATE 11/30/83
				LOCATION 293	REQUEST NO. 938-0159
±25% Mc 2084	CLERK	TECHNICIAN	COST ENGR. A. VAZQUEZ	WORK ORDER EXPENSE	ACCOUNT 05100

ACCT	DESCRIPTION	ESTIMATE BASIS	DIRECT MAN HOURS	DOLLARS DIRECT LABOR	SUBCONTRACTS	MATERIAL	TOTAL
	SUBTOTAL - DIRECT LABOR AND MATERIAL		594	3760	—	3440	7200
6999	LABOR BURDEN (NOTE 1)						
09685	LOCATION OVERHEAD (NOTE 2)	140% X LABOR					5300
9900	GENERAL ADMINISTRATION OVERHEAD (NOTE 3)						~~~
	SUB-TOTAL						12500
8066	DEFINITION OF FACILITIES - ENGINEERING (NOTE 4)						
08067	POST CBP ENGINEERING - UCC (NOTE 5)	12% X S/T					1500
8068	POST CBP ENGINEERING - CONTRACTOR (NOTE 5)						
8069	STARTUP ENGINEERING (NOTE 6)						
8070	COMPUTER PROGRAMMING						~~~
	SUBTOTAL - DIRECT AND INDIRECT COSTS						14000
09999	CONTINGENCIES (NOTE 7)	7% X S/T					1000
	TOTAL ESTIMATE						15000
	UNASSIGNED FUNDS, %						
	TOTAL BUDGET AUTHORIZATION					$	15000

NOTES:
1. LABOR BURDEN INCLUDES EMPLOYER'S CONTRIBUTION TO FICA, WORKMEN'S COMPENSATION, OTHER PAYROLL TAXES AND INSURANCE, "SHOWUP" PAY, CRAFT TRAVEL, CRAFT FRINGE BENEFITS, HOLIDAY PAY, AND OTHER UNION FRINGES, AS APPLICABLE TO FIELD LABOR.
2. LOCATION OVERHEAD INCLUDES INDIRECT COSTS INCURRED BY UCC AND THE CONTRACTOR (IF APPLICABLE) AT THE FIELD LOCATION INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING ACTIVITIES: GENERAL SUPERVISION, CRAFT SUPERVISION, TIME KEEPING, FIELD PURCHASING, FIELD ACCOUNTING, WAREHOUSING AND MATERIAL CONTROL, TEMPORARY BUILDINGS, TEMPORARY UTILITIES, AND UNALLOCABLE CONSTRUCTION LABOR SUCH AS WELDER QUALIFICATION, WATCHMEN, JANITORS, ETC.
3. GENERAL ADMINISTRATION OVERHEAD INCLUDES ENGINEERING DEPARTMENT CONSTRUCTION MANAGEMENT NOT ASSIGNABLE TO SPECIFIC LOCATION, AND OTHER CONSTRUCTION AND INSPECTION COSTS WHICH CANNOT BE ASSIGNED TO A SPECIFIC PROJECT OR SPECIFIC LOCATION.
4. DEFINITION OF FACILITIES ENGINEERING IS THE COST OF PRELIMINARY ENGINEERING REQUIRED TO COMPLETELY DEFINE THE FACILITIES AND PREPARE AN APPROPRIATION QUALITY ESTIMATE OF COST.
5. POST-CBP ENGINEERING INCLUDES THE COST OF BOTH UCC AND CONTRACT ENGINEERING FROM COMPLETION OF THE DOF THROUGH PHYSICAL COMPLETION OF THE PROJECT.
6. STARTUP ENGINEERING INCLUDES THE CAPITALIZABLE COST OF THE ENGINEERING SERVICES FROM PHYSICAL COMPLETION THROUGH SUCCESSFUL OPERATION OF THE PROJECT AS DEFINED IN THE DOF REPORT.
7. CONTINGENCIES ARE ALLOWANCES FOR UNDEFINED AND UNFORESEEABLE DEVIATIONS FROM THE IDEAL PROGRESS OF THE JOB. EXAMPLES OF ITEMS WHICH MAY BE COVERED BY CONTINGENCIES ARE THE COSTS CAUSED BY: UNFORESEEN FIELD CHANGES WITHIN ORIGINAL PROJECT SCOPE, CONSTRUCTION PROBLEMS, STRIKES, DELAYS IN MATERIAL DELIVERY, FORCE MAJEURE, ETC. CHANGES IN SCOPE ARE SPECIFICALLY EXCLUDED.

ENGINEERING DEPARTMENT
Union Carbide Caribe Inc.
Ethylene Oxide Glycol Division
ESTIMATE SUMMARY Const. by Hanley, [illegible]

TITLE	SHEET NO	DATE
Ground Burners & Pit Clean-up	1-3	11/16/83
	LOCATION 293	REQUEST NO 83-0157
ESTIMATE TYPE ±10% [illegible] 4283 Ref. No.	COST ENGINEER A. Vazquez	ORDER NO

H-101-

ITEM NUMBER	DESCRIPTION	QUANTITY	UNIT	LABOR MANHOURS UNIT	LABOR MANHOURS TOTAL	MATERIAL UNIT $	MATERIAL TOTAL $	TOTAL COST $
52000	SITE IMPROVEMENTS & CIVIL							
	CLEARING OF AREA (CUT GRASS/CLEAN WORKING	ALLOW	—	—	12	—	—	
	SITE) 20'X80' = 1600SF							
	EXCAVATION (MACHINE & BY HAND)	363	CY	.25	91	—	—	
	BACKFILL " " " CALICHE	186	CY	.15	28	8	1500	
	DEWATERING OF BURNERS PIT	ALLOW	—	—	8	—	—	
	DISPOSAL OF RESIDUES TO EXSTING UCC I-	ALLOW	—	—	32	—	—	
	PUNTILLA PONDS & INDUSTRIAL LANDFILL							
					171			
	MISC. MATERIAL & UNLISTED	ALLOW	—	—	18	—	200	
					179			
	MH FACTOR = 1.6 X 179				286			
	MH RATE = 6.40 X 286				1800			
	TOTAL =				1800		1700	3500
56000	PIPING:							
	INSTALL 3"-150# BLIND FLANGES	2	EA	2	4	20	40	
	FABRICATE & INSTALL 2" GALV. PIPE SPOOL (6'LG)	1	EA	—	24	—	200	
	CLEANING & FLUSHING 3" LINES W/WATER & STEAM	ALLOW	—	—	32	—	100	
	HOOK-UP'S FOR WATER & STEAM FROM EXIST. FACILITIES	ALLOW	—	—	16	—	100	
	HAUL & HANDLING	ALLOW	—	—	12	—	—	
	MISC. MATERIAL & UNLISTED	ALLOW	—	—	16	—	100	
			SUBTOTAL BASE LABOR		104			
	SUBTOTAL		MH FACTOR 1.6		166			
	TOTAL		$ RATE 6.40		1060		540	1600

I-102-

ENGINEERING DEPARTMENT
Union Carbide Caribe Inc.
Oxide Glycol Division
ESTIMATE – LABOR AND MATERIAL P-23-25C

TITLE GROUND BURNERS & PIT CLEAN-UP (RCRA PERMIT-PART B				SHEET NO. 3-3m	DATE 11/16/83
REF. NO.				LOCATION 293	REQUEST NO. 23-0157
±10% MC 4233	CLERK	TECHNICIAN	COST ENGR. A. VASQUEZ	WORK ORDER	ACCOUNT AS NOTED

ACCT	DESCRIPTION	ESTIMATE BASIS	DIRECT MAN HOURS	DOLLARS			
				DIRECT LABOR	SUBCONTRACTS	MATERIAL	TOTAL
52000	SITE IMPROVEMENTS & CIVIL		286	1800	—	1700	3500
56000	PIPING		166	1060	—	540	1600
	SUB-TOTAL		452	2860		2240	5100
61000	CONST. EQUIP. & OPERATORS		78	500	—	1000	1500
62000	SCAFFOLDING & CLEAN-UP		16	100	—	50	150
63000	CONST. FACILITIES & SERVICES		24	150	—	50	200
71000	START-UP COSTS		—	—	—	—	—
76000	BACKCHARGES		—	—	—	—	—
77000	CONSTRUCTION ORDERS		24	150	—	100	250
	SUBTOTALS		594	3760	—	3440	7200

ENGINEERING DEPARTMENT
Union Carbide Caribe Inc.
Ethylene Oxide Glycol Division

ESTIMATE SUMMARY

TITLE: GROUND BURNERS & PIT CLEAN-UP
ESTIMATE TYPE: ±10% M/H 4Q83 REEND.
SHEET NO.: 2-3
LOCATION: 293
COST ENGINEER: A. VAZQUEZ
DATE: 11/16/83
REQUEST NO.: 938-015
ORDER NO.:

ACCT	DESCRIPTION	ESTIMATE BASIS	DIRECT MAN HOURS	DOLLARS			
				DIRECT LABOR	SUBCONTRACTS	MATERIAL	TOTAL
	SUBTOTAL - DIRECT LABOR AND MATERIAL		471	3020	—	1980	5000
6999	LABOR BURDEN (NOTE 1)						
09685	LOCATION OVERHEAD (NOTE 2)	140% X LABOR					4200 ✓
9980	GENERAL ADMINISTRATION OVERHEAD (NOTE 3)						
	SUB-TOTAL						9200
8066	DEFINITION OF FACILITIES - ENGINEERING (NOTE 4)						
08067	POST CBP ENGINEERING - UCC (NOTE 5)	20% X S/T					1800
8068	POST CBP ENGINEERING - CONTRACTOR (NOTE 5)						
8069	STARTUP ENGINEERING (NOTE 6)						
8070	COMPUTER PROGRAMMING						
	SUBTOTAL - DIRECT AND INDIRECT COSTS						11000
04999	CONTINGENCIES (NOTE 7)	9 % X S/T					1000
	TOTAL ESTIMATE						12000
	UNASSIGNED FUNDS, 0%						
	TOTAL BUDGET AUTHORIZATION						12000

NOTES:
1. LABOR BURDEN INCLUDES EMPLOYER'S CONTRIBUTION TO FICA, WORKMEN'S COMPENSATION, OTHER PAYROLL TAXES AND INSURANCE, "SHOWUP" PAY, CRAFT TRAVEL, CRAFT FRINGE BENEFITS, HOLIDAY PAY, AND OTHER UNION FRINGES, AS APPLICABLE TO FIELD LABOR.
2. LOCATION OVERHEAD INCLUDES INDIRECT COSTS INCURRED BY UCC AND THE CONTRACTOR (IF APPLICABLE) AT THE FIELD LOCATION INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING ACTIVITIES: GENERAL SUPERVISION, CRAFT SUPERVISION, TIME KEEPING, FIELD PURCHASING, FIELD ACCOUNTING, WAREHOUSING AND MATERIAL CONTROL, TEMPORARY BUILDINGS, TEMPORARY UTILITIES, AND UNALLOCABLE CONSTRUCTION LABOR SUCH AS WELDER QUALIFICATION, WATCHMEN, JANITORS, ETC.
3. GENERAL ADMINISTRATION OVERHEAD INCLUDES ENGINEERING DEPARTMENT CONSTRUCTION MANAGEMENT NOT ASSIGNABLE TO SPECIFIC LOCATION, AND OTHER CONSTRUCTION AND INSPECTION COSTS WHICH CANNOT BE ASSIGNED TO A SPECIFIC PROJECT OR SPECIFIC LOCATION.
4. DEFINITION OF FACILITIES ENGINEERING IS THE COST OF PRELIMINARY ENGINEERING REQUIRED TO COMPLETELY DEFINE THE FACILITIES AND PREPARE AN APPROPRIATION QUALITY ESTIMATE OF COST.
5. POST-CBP ENGINEERING INCLUDES THE COST OF BOTH UCC AND CONTRACT ENGINEERING FROM COMPLETION OF THE DCF THROUGH PHYSICAL COMPLETION OF THE PROJECT.
6. STARTUP ENGINEERING INCLUDES THE CAPITALIZABLE COST OF THE ENGINEERING SERVICES FROM PHYSICAL COMPLETION THROUGH SUCCESSFUL OPERATION OF THE PROJECT AS DEFINED IN THE DCF REPORT.
7. CONTINGENCIES ARE ALLOWANCES FOR UNDEFINED AND UNFORESEEABLE DEVIATIONS FROM THE IDEAL PROGRESS OF THE JOB. EXAMPLES OF ITEMS WHICH MAY BE COVERED BY CONTINGENCIES ARE THE COSTS CAUSED BY: UNFORESEEN FIELD CHANGES WITHIN ORIGINAL PROJECT SCOPE, CONSTRUCTION PROBLEMS, STRIKES, DELAYS IN MATERIAL DELIVERY, FORCE MAJEURE, ETC. CHANGES IN SCOPE ARE SPECIFICALLY EXCLUDED.

I-104-

ENGINEERING DEPARTMENT
Union Carbide Caribe Inc.
Ethylene Oxide Glycol Division
ESTIMATE SUMMARY CONST. BY EACHRY
OF A ENG. HEATER PROJECT

TITLE REMOVE OIL-SOAKED GROUNDS		SHEET NO 1-3	DATE 10/4/82
AT SALVAGE YARD WAREHOUSE		LOCATION 293	REQUEST NO 938-01623
ESTIMATE TYPE ± 10 %	M= 4283 REF. NO. 8311803	COST ENGINEER D. VAZQUEZ	ORDER NO 930

ACCT	DESCRIPTION	ESTIMATE BASIS	DIRECT MAN HOURS	DOLLARS			
				DIRECT LABOR	SUBCONTRACTS	MATERIAL	TOTAL
52000	SITE IMPROVEMENTS & CIVIL		331	2120	—	880	3000
61000	CONST. EQUIP. & OPERATORS		47	300	—	700	1000
62000	SCAFFOLDING & CLEAN-UP		31	200	—	—	200
63000	CONST. FACILITIES & SERVICES		31	200	—	200	400
71000	START-UP COSTS		—	—	—	—	—
76000	BACKCHARGES		—	—	—	—	—
77000	CONSTRUCTION ORDERS		31	200	—	200	400
SUBTOTALS			471	3020	—	1980	5000

ENGINEERING DEPARTMENT
Union Carbide Caribe Inc.
Ethylene Oxide Glycol Division
ESTIMATE SUMMARY

TITLE: REMOVE OIL-SOAKED GROUNDS AT SALVAGE YARD WAREHOUSE
SHEET NO: 2-3
DATE: 10/4/8
LOCATION: 293
REQUEST NO: 933-016
ESTIMATE TYPE:
COST ENGINEER:
ORDER NO:

ITEM NUMBER	DESCRIPTION	QUANTITY	UNIT	LABOR MANHOURS UNIT	LABOR MANHOURS TOTAL	MATERIAL UNIT $	MATERIAL TOTAL $	TOTAL COST $
52000	SITE IMPROVEMENTS & CIVIL:							
	EXCAVATION	85	CY	.5	43	—	—	
	BACKFILL (CALICHE)	85	CY	.25	21	8	680	
	GRADING:							
	SPREAD (MOTOR GRADER)	85	CY	.05	5	—	—	
	TAMP (PNEUMATICALLY)	85	CY	.5	43	—	—	
	SHAPE & COMPACT (MOTOR GRADER & BY HAND)	250	SY	.06	15	—	—	
					~~		~~~	
					127		680	
	CLEAN-UP	ALLOW	—	—	24	—	—	
	HAUL & HANDLING	ALLOW	—	—	16	—	—	
	MISC. MATERIAL & UNLISTED	ALLOW	—	—	40	—	200	
			SUBTOTAL BASE LABOR		207			
	SUBTOTAL		MH FACTOR 1.6		331			
	TOTAL		$ RATE 6.40		2120		880	3000

ENGINEERING DEPARTMENT
Union Carbide Caribe Inc.
Oxide Glycol Division
ESTIMATE – LABOR AND MATERIAL

P-23-25C

TITLE REMOVE OIL-SOAKED GROUNDS AT SALVAGE YARD WAREHOUSE REF. NO. 8311803				SHEET NO. 3-3	DATE 10/4/83
				LOCATION 293	REQUEST NO. 938-3162
±10% MC4Q83	CLERK	TECHNICIAN	COST ENGR. A. VAZQUEZ	WORK ORDER 930	ACCOUNT 52000

ATTACHMENT I-2

Post-Closure Cost Estimates

	1983 Costs
Dewatered Sludge Landfill	$34.5M
Wastewater Treatment Facility Impoundments	
Aeration Basins/Equalization Basins	$19.9M
Primary Solids Ponds	$38.6M
Industrial Landfill	$85.0M

ACCT	DESCRIPTION	ESTIMATE BASIS	DIRECT MAN HOURS	DOLLARS			
				DIRECT LABOR	SUBCONTRACTS	MATERIAL	TOTAL
	MAINTENANCE OF DEWATERED LANDFILL						
	MOWING LANDFILL 6.75 ACRES	9 TIMES/YEAR			3000		
	SPRAYING	3 TIMES/YEAR			1000		
	GROUNDWATER SAMPLES LAB ANALYSIS	4 TIMES/YEAR			12,000		
	ANNUAL INSPECTION by LICENSED ENGINEER	40 HRS/YEAR			4000		
	COVER MAINTENANCE BY BULLDOZER				2900		
	REPLACEMENT OF MONITOR WELLS				1000		
	RESEEDING 5% of SURFACE				300		
	SUBTOTAL				23,700		23,700
	UCC ADMINISTRATIVE COSTS	7% of 5/1				1700	1100
	CONTINGENCY	25% of 5/1				5900	5900
	NOTE: COSTS ARE ESTIMATED FOR 1981 ONLY. ADJUST ACCORDINGLY, APPROXIMATELY 5% PER YEAR.						
	1983 Adjusted Cost: $34,500						
	TOTAL						31,300

ENGINEERING DEPARTMENT
UNION CARBIDE CORPORATION
CHEMICALS AND PLASTICS
ESTIMATE SUMMARY

TITLE: ANNUAL POST-CLOSURE MAINTENANCE COST		SHEET NO. 1-1	DATE 11/22/83
DEWATERED SLUDGE LANDFILL		LOCATION 273	REQUEST NO. —
ESTIMATE TYPE		COST ENGINEER	ORDER NO. —

ACCT	DESCRIPTION	ESTIMATE BASIS	DIRECT MAN HOURS	DOLLARS			
				DIRECT LABOR	SUBCONTRACTS	MATERIAL	TOTAL
	MAINTENANCE OF PRIMARY SOLIDS POND						
	MOWING PSP COVER 3 ACRES	9 TIMES/YEAR			1500		
	SPRAYING	3 TIMES/YEAR			500		
	GROUNDWATER SAMPLES AND ANALYSIS	6 TIMES/YEAR			18000		
	ANNUAL INSPECTION BY LICENSED ENGINEER	40 HRS/YEAR			4000		
	COVER MAINTENANCE BY BULLDOZER				1200		
	REPLACE MONITOR WELL				1000		
	RESEED 5% OF SURFACE				300		
	SUB TOTAL				26,500		26,500
	UCC ADMINISTRATION COSTS	7% S/T				1900	1900
	CONTINGENCY	25% S/T				6600	6600
	NOTE: COSTS ARE ESTIMATED FOR 1981 ONLY. ADJUST ACCORDINGLY, APPROXIMATELY 5% PER YEAR. 1983 Adjusted Cost: $38,600						
	TOTAL						35,000

ENGINEERING DEPARTMENT
UNION CARBIDE CORPORATION
CHEMICALS AND PLASTICS
ESTIMATE SUMMARY

TITLE: ANNUAL POST-CLOSURE MAINTENANCE COST		SHEET NO. 1-1	DATE 11/22/8
PRIMARY SOLIDS PONDS		LOCATION 293	REQUEST NO. -
ESTIMATE TYPE		COST ENGINEER	ORDER NO.

ACCT	DESCRIPTION	ESTIMATE BASIS	DIRECT MAN HOURS	DOLLARS			
				DIRECT LABOR	SUBCONTRACTS	MATERIAL	TOTAL
	MAINTENANCE of AERATION BASINS / EQUALIZATION BASINS						
	MOWING BASINS SURFACE COVER	9 TIMES / YEAR			9000		
	SPRAYING	3 TIMES / YEAR			3000		
	GROUND WATER SAMPLES LAB ANALYSIS	6 TIMES / YEAR			18,000		
	ANNUAL INSPECTION BY LICENSED ENGINEER	40 HRS / YEAR			1000		
	SLOPE MAINTENANCE BY BULLDOZER				1200		
	REPLACEMENT OF MONITORING WELL				1000		
	RESEEDING 5% OF SURFACE				300		
	SUBTOTAL				36,500		36,500
	UCC ADMINISTRATIVE COSTS	7% S/T				7500	7500
	CONTINGENCY	25% S/T				9000	9000
	NOTE: COSTS ARE ESTIMATED FOR 1981 ONLY. ADJUST ACCORDINGLY, ACCORDINGLY 5% PER YEAR. 1983 Adjusted Cost: $18,900						
	TOTAL						18,000

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ENGINEERING DEPARTMENT
UNION CARBIDE CORPORATION
CHEMICALS AND PLASTICS
ESTIMATE SUMMARY

TITLE: ANNUAL POST-CLOSURE MAINTENANCE COST
AERATION BASINS / EQUALIZATION BASINS
ESTIMATE TYPE

SHEET NO. 1-1
LOCATION 293
COST ENGINEER

DATE 11/22/83
REQUEST NO. —
ORDER NO —

ACCT	DESCRIPTION	ESTIMATE BASIS	DIRECT MAN HOURS	DOLLARS			
				DIRECT LABOR	SUBCONTRACTS	MATERIAL	TOTAL
	MAINTENANCE of N.W. LANDFILL						
	MOWING LANDFILL 23.6 ACRES	9 TIMES / YEAR			9000		
	SPRAYING LANDFILL	3 TIMES / YEAR			3000		
	GROUNDWATER SAMPLES LAB ANALYSIS	4 TIMES / YEAR			36000		
	ANNUAL INSPECTION By LICENSED ENGINEER	40 HRS / YEAR			4000		
	COVER MAINTENANCE By D.B. DOZER				4800		
	REPLACEMENT OF MONITOR WELLS				1000		
	RESEEDING 5% of SURFACE				900		
	SUBTOTAL				58,700		58,700
	UCC ADMINISTRATION COSTS	17% of S/T				9,900	9,900
	CONTINGENCY	25% of S/T				14,200	14,200
	NOTE: COSTS ARE ESTIMATED FOR 1981 ONLY. ADJUST ACCORDINGLY, APPROXIMATELY 5% PER YEAR. 1983 Adjusted Cost: $85,000						
	TOTAL						77,000

ENGINEERING DEPARTMENT
UNION CARBIDE CORPORATION
CHEMICALS AND PLASTICS
ESTIMATE SUMMARY

TITLE: ANNUAL POST-CLOSURE MAINTENANCE COST		SHEET NO. 1 of 1	DATE 11/22/83
INDUSTRIAL LANDFILL		LOCATION 293	REQUEST NO. —
ESTIMATE TYPE +25% -25%		COST ENGINEER WIRT	ORDER NO. —

ATTACHMENT I-3

Financial Assurance Documents

Sudden/Accidental Pollution Liability Coverage

Non-Sudden Pollution Liability Coverage

Closure/Post-Closure Cost Assurance

UNION CARBIDE CORPORATION OLD RIDGEBURY ROAD, DANBURY, CT 06817
Insurance Department

July 2, 1982

Environmental Protection Agency
Region II Offices
26 Federal Plaza
New York, New York 10017

RE: American Motorists Insurance Co.
Policies # OZM578450 & 2SB010120

Gentlemen:

Enclosed are certificates of insurance, as evidence of Union Carbide Corporation's sudden/accidental pollution liability insurance coverage under the policies captioned above.

These certificates have been issued in accordance with section 40 CFR 264.147 and 265.147 of R.C.R.A. with respect to the hazardous waste treatment, storage, and disposal facilities owned/operated by Union Carbide within your Region.

We trust these enclosures will be found in order.

Very truly yours,

RMThode:ls
enc.

Corporate Insurance Manager

Hazardous Waste Facility Certificate of Pollution Liability Insurance

1. American Motorists Insurance Company, (the "Insurer"), of 5 World Trade Center, New York, New York 10048 hereby certifies that it has issued pollution liability insurance covering bodily injury and property damage to Union Carbide Corporation, (the "insured"), of Old Ridgebury Road, Danbury, CT 06817 in connection with the insured's obligation to demonstrate financial responsibility under 40 CFR 264.147 or 265.147. The coverage applies at:

Location Name	Address	EPA I.D. #
Carbon Products Division	Buffalo & Portage Rd. Niagara Falls, NY 14302	NYD-00210692G
Union Carbide Grafito, Inc.	Road No. 3 Yabucoa, PR 00767	PRD-090130832
Union Carbide Caribe, Inc.	Tallaboa (Main Plant) Ponce, PR 00731	PRT-000010009
Union Carbide Caribe, Inc.	Rio Cayo (Dock) Ponce, PR 00731	PRT-000010025
Union Carbide Caribe, Inc.	Puntilla Facility Ponce, PR 00731	PRT-000010017

for sudden accidental occurrences.

The limits of liability are $500,000. each occurrence, $1,000,000. aggregate bodily injury and $1,000,000. aggregate property damage, exclusive of legal defense costs. The coverage is provided under policy number OZM 578 450, issued on 1/1/80. The effective date of said policy is 1/1/80.

2. The Insurer further certifies the following with respect to the insurance described in Paragraph 1:

   (a) Bankruptcy or involvency of the insured shall not relieve the Insurer of its obligations under the policy.

   (b) The Insurer is liable for the payment of amounts within any deductible applicable to the policy, with a right of reimbursement by the insured for any such payment made by the Insurer. This provision does not apply with respect to that amount of any deductible for which coverage is demonstrated as specified in 40 CFR 264.147(f) or 265.147(f).

   (c) Whenever requested by a Regional Administrator of the U.S. Environmental Protection Agency (EPA), the Insurer agrees to furnish to the Regional Administrator a signed duplicate original of the policy and all endorsements.

   (d) Cancellation of the insurance, whether by the Insurer or the insured, will be effective only upon written notice and only after the expiration of sixty (60) days after a copy of such written notice is received by the Regional Administrator(s) of the EPA Region(s) in which the facility(ies) is (are) located.

   (e) Any other termination of the insurance will be effective only upon written notice and only after the expiration of thirty (30) days after a copy of such written notice is received by the Regional Administrator(s) of the EPA Region(s) in which the facility(ies) is (are) located.

   I hereby certify that the wording of this instrument is identical to the wording specified in 40 CFR 264.151(j) as such regulation was constituted on the date first above written, and that the Insurer is licensed to transact the business of insurance, or eligible to provide insurance as an excess or surplus lines insurer, in one or more States.

Signature of authorized representative of Insurer J. J. Towey

J. J. Towey
Division Underwriting Officer

Authorized Representative of American Motorists Insurance Company
5 World Trade Center
New York, New York 10048

Hazardous Waste Facility Certificate of Pollution Liability Insurance

1. American Motorists Insurance Company, (the "Insurer"), of 5 World Trade Center, New York, New York 10048 hereby certifies that it has issued pollution liability insurance covering bodily injury and property damage to Union Carbide Corporation, (the "insured"), of Old Ridgebury Road, Danbury, CT 06817 in connection with the insured's obligation to demonstrate financial responsibility under 40 CFR 264.147 or 265.147. The coverage applies at:

Location Name	Address	EPA I.D. #
Carbon Products Division	Buffalo & Portage Rd. Niagara Falls, NY 14302	NYD-002106920
Union Carbide Grafito, Inc.	Road No. 3 Yabucoa, PR 00767	PRD-090130832
Union Carbide Caribe, Inc.	Tallaboa (Main Plant) Ponce, PR 00731	PRT-000010009
Union Carbide Caribe, Inc.	Rio Cayo (Dock) Ponce, PR 00731	PRT-000010025
Union Carbide Caribe, Inc.	Puntilla Facility Ponce, PR 00731	PRT-000010017

for sudden accidental occurrences.

The limits of liability are $500,000. each occurrence and $1,000,000. aggregate excess of primary limits of $500,000. each occurrence and $1,000,000. aggregate, exclusive of legal defense costs. The coverage is provided under policy number 2SB 010 120, issued on 3/1/82. The effective date of said policy is 3/1/82.

2. The Insurer further certifies the following with respect to the insurance described in Paragraph 1:

   (a) Bankruptcy or involvency of the insured shall not relieve the Insurer of its obligations under the policy.

   (b) The Insurer is liable for the payment of amounts within any deductible applicable to the policy, with a right of reimbursement by the insured for any such payment made by the Insurer. This provision does not apply with respect to that amount of any deductible for which coverage is demonstrated as specified in 40 CFR 264.147(f) or 265.147(f).

   (c) Whenever requested by a Regional Administrator of the U.S. Environmental Protection Agency (EPA), the Insurer agrees to furnish to the Regional Administrator a signed duplicate original of the policy and all endorsements.

   (d) Cancellation of the insurance, whether by the Insurer or the insured, will be effective only upon written notice and only after the expiration of sixty (60) days after a copy of such written notice is received by the Regional Administrator(s) of the EPA Region(s) in which the facility(ies) is (are) located.

   (e) Any other termination of the insurance will be effective only upon written notice and only after the expiration of thirty (30) days after a copy of such written notice is received by the Regional Administrator(s) of the EPA Region(s) in which the facility(ies) is (are) located.

   I hereby certify that the wording of this instrument is identical to the wording specified in 40 CFR 264.151(j) as such regulation was constituted on the date first above written, and that the Insurer is licensed to transact the business of insurance, or eligible to provide insurance as an excess or surplus lines insurer, in one or more States.

Signature of authorized representative of Insurer J. J. Towey

J. J. Towey
Division Underwriting Officer

Authorized Representative of American Motorists Insurance Company
5 World Trade Center
New York, New York 10048

UNION CARBIDE CORPORATION OLD RIDGEBURY ROAD, DANBURY, CT 06817
Insurance Department

August 23, 1983

Environmental Protection Agency
Region II Offices
26 Federal Plaza
New York, New York 10017

RE: American Manufacturers' Mutual Insurance Company
Policy No. 3LE-576-090

Gentlemen:

Enclosed are certificates of insurance, as evidence of Union Carbide Corporation's non-sudden pollution/environmental impairment liability insurance under the above-captioned policy. You will note, this policy will become effective September 7, 1983. For your information, similar coverage under International Insurance Company policy #560-000-116 is being terminated as of that date.

These certificates have been issued in accordance with Section 40 CFR 264.147 and 265.147 of R.C.R.A. Insurance certificates have been issued for each hazardous waste treatment, storage, and disposal facility owned/operated by Union Carbide located within your Region.

We trust these enclosures will be found in order.

Very truly yours,
UNION CARBIDE CORPORATION

Corporate Insurance Manager

RMThode:ls
enc.

bcc: Dr. H. M. Parker - P2613
Ms. S. H. Shumway - E3248

EPA Region # II

Hazardous Waste Facility Certificate of Pollution Liability Insurance

1. American Manufacturers Mutual Insurance Company, (the "Insurer"), of 5 World Trade Center, New York, New York 10048 hereby certifies that it has issued pollution liability insurance covering bodily injury and property damage to Union Carbide Corporation (the "insured"), of Old Ridgebury Road, Danbury, CT 06817 in connection with the insured's obligation to demonstrate financial responsibility under 40 CFR 264.147 or 265.147. The coverage applies at:

Location Name	Address	EPA I.D. #
Carbon Products Division	Buffalo & Portage Rd. Niagara Falls, NY 14302	NYD-002106920
Union Carbide Grafito, Inc.	Road No. 3 Yabucoa, PR 00767	PRD-090130832
Union Carbide Caribe, Inc.	Tallaboa (Main Plant) Ponce, PR 00731	PRT-000010009
Union Carbide Caribe, Inc.	Rio Cayo (Dock) Ponce, PR 00731	PRT-000010025
Union Carbide Caribe, Inc.	Puntilla Facility Ponce, PR 00731	PRT-000010017

nonsudden accidental occurrences.

The limits of liability are $3,000,000. each occurrence, $6,000,000. annual aggregate, exclusive of legal defense costs. The coverage is provided under policy number 3LE 576 090, issued on 9/7/83. The effective date of said policy is 9/7/83.

2. The Insurer further certifies the following with respect to the insurance described in Paragraph 1:

   (a) Bankruptcy or insolvency of the insured shall not relieve the Insurer of its obligations under the policy.

   (b) The Insurer is liable for the payment of amounts within any deductible applicable to the policy, with a right of reimbursement by the insured for any such payment made by the Insurer. This provision does not apply with respect to that amount of any deductible for which coverage is demonstrated as specified in 40 CFR 264.147(f) or 265.147(f).

   (c) Whenever requested by a Regional Administrator of the U.S. Environmental Protection Agency (EPA), the Insurer agrees to furnish to the Regional Administrator a signed duplicate original of the policy and all endorsements.

   (d) Cancellation of the insurance, whether by the Insurer or the insured, will be effective only upon written notice and only after the expiration of sixty (60) days after a copy of such written notice is received by the Regional Administrator(s) of the EPA Region(s) in which the facility(ies) is (are) located.

   (e) Any other termination of the insurance will be effective only upon written notice and only after the expiration of thirty (30) days after a copy of such written notice is received by the Regional Administrator(s) of the EPA Region(s) in which the facility(ies) is (are) located.

I hereby certify that the wording of this instrument is identical to the wording specified in 40 CFR 264.151(j) as such regulation was constituted on the date first above written, and that the Insurer is licensed to transact the business of insurance, or eligible to provide insurance as an excess or surplus lines insurer, in one or more States.

Signature of authorized representative of Insurer _____

W. J. Loughan
Division Special Risk Officer

Authorized Representative of American Manufacturers Mutual Insurance Company
5 World Trade Center
New York, New York 10048

UNION CARBIDE CORPORATION
OLD RIDGEBURY ROAD
DANBURY, CT 06817

J. CLAYTON STEPHENSON
EXECUTIVE VICE PRESIDENT

September 21, 1983

State of Indiana
Environmental Management Board
1330 West Michigan Street
P.O. Box 1964
Indianapolis, IN 46206

Attention: Technical Secretary of the Indiana Environmental Management Board

Gentlemen:

I am the chief financial officer of Union Carbide Corporation, Old Ridgebury Road, Danbury, CT 06817. This letter is in support of this firm's use of the financial test to demonstrate financial assurance, as specified in 320 IAC 4-7-3 through and including 320 IAC 4-7-36.

1. This firm is the owner or operator of the following facilities for which financial assurance for closure or post-closure care is demonstrated through the financial test specified in Subpart H of 40 CFR Parts 264 and 265. The current closure and/or post-closure cost estimates covered by the test are shown for each facility:

Name:	Union Carbide Corporation Silicones & Urethane Intermediates
Address:	So. Charleston, W.V.
EPA #:	WVD005005483 WVD980554828 WVD980554885 WVD000739722
Closure:	$4,038,246
Post-Closure:	$ 100,000

Name:	Union Carbide Corporation Silicones & Urethane Intermediates
Address:	Sisterville, W.V.
EPA #:	WVD004325353
Closure:	$1,666,400
Post-Closure:	$ 721,200

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Name:	Union Carbide Corporation Engineering & Hydrocarbons Division
Address:	So. Charleston, W.V.
EPA #:	WVD060682291
Closure:	$10,090
Post-Closure:	0
Name:	Union Carbide Corporation Linde Division
Address:	Piscataway, N.J.
EPA #:	NJD063173322
Closure:	$3,950
Post-Closure:	0
Name:	Union Carbide Corporation Linde Division
Address:	Tonawanda, N.Y.
EPA #:	NYD002123792
Closure:	$321,500
Post-Closure:	0
Name:	Union Carbide Corporation Linde Division
Address:	Keasbey, N.J.
EPA #:	NJD000632000
Closure:	$29,703
Post-Closure:	0
Name:	Union Carbide Corporation Carbon Products Division
Address:	Niagara Falls, N.Y.
EPA #:	NYD002106920
Closure:	$27,000
Post-Closure:	0
Name:	Union Carbide Corporation Specialty Chemicals Division
Address:	Bound Brook, N.J.
EPA #:	NJD002444719
Closure:	$78,000
Post-Closure:	0
Name:	Union Carbide Corporation Linde Division
Address:	Ashtabula, Ohio
EPA #:	OHD000821454
Closure:	$156,000
Post-Closure:	$ 72,000

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Name:	Union Carbide Corporation Linde Division
Address:	East Chicago, Indiana
EPA #:	IND077001147
Closure:	$11,881
Post-Closure:	0
Name:	Union Carbide Corporation Films Packaging Division
Address:	Kentland, Indiana
EPA #:	IND000708545
Closure:	$3,600
Post-Closure:	0
Name:	Union Carbide Corporation Carbon Products Division
Address:	Fostoria, Ohio
EPA #:	OHD004167219
Closure:	$33,000
Post-Closure:	0
Name:	Union Carbide Corporation Carbon Products Division
Address:	Lakewood, Ohio
EPA #:	OHD004167383
Closure:	$45,000
Post-Closure:	0
Name:	Union Carbide Corporation Electrode Systems Division
Address:	Parma, Ohio
EPA #:	OHD003926748
Closure:	$10,000
Post-Closure:	0
Name:	Union Carbide Corporation Special Polymers & Composites Division
Address:	Marietta, Ohio
EPA #:	OHD077479467
Closure:	$1,548,000
Post-Closure:	0

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2. This firm guarantees, through the corporate guarantee specified in Subpart H of 40 CFR Parts 264 and 265, the closure or post-closure care of the following facilities owned or operated by subsidiaries of this firm. The current cost estimates for the closure or post-closure care so guaranteed are shown for each facility:

Name:	Union Carbide Agricultural Products Company, Inc.
Address:	Institute, W.V.
EPA #:	WVD005005509
Closure:	$569,708
Post-Closure:	$127,792

3. In states, where EPA is not administering the financial requirements of Subpart H or 40 CFR Parts 264 or 265, this firm, as owner or operator or guarantor, is demonstrating financial assurance for the closure or post-closure care of the following facilities through the use of a test equivalent or substantially equivalent to the financial test specified in Subpart H of 40 CFR Parts 264 and 265. The current closure and/or post-closure cost estimates covered by such test are shown for each facility.

Name:	Soilserv, Inc.
Address:	Salinas, California
EPA #:	CAD009165325
Closure:	$16,633
Post-Closure:	0

Name:	Soilserv, Inc.
Address:	Hollister, California
EPA #:	CAD000626499
Closure:	$17,822
Post-Closure:	0

Name:	Soilserv, Inc.
Address:	King City, California
EPA #:	CAD094974078
Closure:	$21,985
Post-Closure:	0

Name:	Union Carbide Corporation Films Packaging Division
Address:	Centerville, Iowa
EPA #:	IAD041580721
Closure:	$14,300
Post-Closure:	0

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Name:	Union Carbide Corporation Films Packaging Division
Address:	Osceola, Arkansas
EPA #:	ARD078582301
Closure:	$12,000
Post-Closure:	0

Name:	Union Carbide Corporation Films Packaging Division
Address:	Bedford Park, Illinois
EPA #:	ILD005152954
Closure:	$19,000
Post-Closure:	0

Name:	Union Carbide Corporation Films Packaging Division
Address:	Bedford Park, Illinois
EPA #:	ILD000821462
Closure:	$2,900
Post-Closure:	0

Name:	Union Carbide Corporation Films Packaging Division
Address:	Loudon, Tennessee
EPA #:	TND034730267
Closure:	$6,000
Post-Closure:	0

Name:	Union Carbide Corporation Battery Products Division
Address:	St. Albans, Vermont
EPA #:	VTD002065654
Closure:	$161,120
Post-Closure:	0

Name:	Union Carbide Corporation Polyolefins Division
Address:	Port Lavaca, Texas
EPA #:	TXD041515420
Closure:	$6,980,000
Post-Closure:	$ 85,000

Name:	Union Carbide Corporation Solvents & Coatings Materials Division
Address:	Brownsville, Texas
EPA #:	TXD008114092
Closure:	$53,600
Post-Closure:	$65,400

Name:	Union Carbide Corporation Solvents & Coatings Materials Division
Address:	Texas City, Texas
EPA #:	TXD000461533 TXD980626782
Closure:	$5,235,500
Post-Closure:	$ 664,100

4. This firm is the owner or operator of the following hazardous waste management facilities for which financial assurance for closure or, if a disposal facility, post-closure care, is not demonstrated either to EPA or a state through the financial test or any other financial assurance mechanism specified in Subpart H of 40 CFR Parts 264 and 265 or equivalent or substantially equivalent state mechanisms. The current closure and/or post closure cost estimates not covered by such financial assurance are shown for each facility:

Name:	Union Carbide Caribe, Inc.
Address:	Ponce, Puerto Rico
EPA #:	PRD980594618 PRD980594857 PRD980594733
Closure:	$4,906,000
Post-Closure:	$2,474,400

Name:	Union Carbide Grafito, Inc.
Address:	Yabucoa, Puerto Rico
EPA #:	PRD090130832
Closure:	$5,000
Post-Closure	0

Name:	Union Carbide Films Packaging, Inc.
Address:	Barceloneta, Puerto Rico
EPA #:	PRT090386897
Closure:	$50,900
Post-Closure:	0

Name:	Union Carbide Corporation Health, Safety & Environmental Affairs Department
Address:	Export, PA
EPA #:	PAD980550354
Closure:	$8,700
Post-Closure	0

Name:	Union Carbide Corporation Engineering Products Division
Address:	Florence, S.C.
EPA #:	SCD005574967
Closure:	$208,000
Post-Closure	$360,000

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Name:	Union Carbide Corporation Engineering Products Division
Address:	Mobile (Chickasaw), Alabama
EPA #:	ALD062464748
Closure:	$44,554
Post-Closure	0
Name:	Union Carbide Corporation Ethylene Oxide/Glycol Division
Address:	Hahnville, Louisiana
EPA #:	LAD041581422
Closure:	$6,500,000
Post-Closure	$ 300,000
Name:	Union Carbide Agricultural Products Company, Inc.
Address:	Woodbine, Georgia
EPA #:	GAD030035356
Closure:	$ 483,500
Post-Closure	$2,495,000

This firm is required to file a Form 10K with the Securities and Exchange Commission (SEC) for the latest fiscal year.

The fiscal year of this firm ends on December 31. The figures for the following items marked with an asterisk are derived from this firm's independently audited, year-end financial statements for the latest completed fiscal year, ended December 31, 1982.

1.	Sum of current closure and post-closure cost estimates (total of all cost estimates shown in the four paragraphs above)	$40,764,484
2.	Current bond rating of most recent issuance of this firm and name of rating service	Standard & Poors A+ Moodys A1
3.	Date of issuance of bond	June 1, 1983
4.	Date of maturity of bond	June 1, 2003
*5.	Tangible net worth (if any portions of the closure and post-closure cost estimates is included in "total liabilities" on your firm's financial statements, you may add the amount of that portion to this line)	$5,094,887,000
*6.	Total assets in U.S. (required only if less than 90% of firm's assets are located in the U.S.	$8,026,246,000

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	YES	NO
7. Is line 5 at least ten million dollars?	X	
8. Is line 5 at least 6 times line 1?	X	
*9. Are at least 90% of firm's assets located in the U.S? If not, complete line 10		X
10. Is line 6 at least 6 times line 1?	X	

I hereby certify that the wording of this letter is identical to the wording specified in 40 CFR 264.151(f) as such regulations were constituted on the date shown immediately below.

J. Clayton Stephenson
Executive Vice-President and
Chief Financial Officer
Date: September 21, 1983

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I-2 POST-CLOSURE PLANS

Post-Closure plans are presented in order for the following facilities.

- Dewatered Sludge Landfill
- Wastewater Treatment Facility Impoundments
  - Aeration Basins
  - Equalization Basins
  - Primary Solids Ponds
- Industrial Landfill

The post-closure plans for the Wastewater Treatment Facility Impoundments are provided in the event that the contingency closure plans must be implemented.

The post-closure plan will be maintained at the facility by the UCCI Environmental Protection Department representatives. The current representative is:

Name:	J. L. Escabi
Mailing Address:	Union Carbide Caribe, Inc. Firm Delivery Ponce, PR 00731
Telephone Number:	(809) 840-2626, extension 4385

Post-closure care plans and costs will be revised and updated as necessary by this representative.

I-2a Security

Security at the facility will be maintained by continuation of existing controls. The land entrance to the wastewater treatment plant is enclosed by a fence. A security guard is present at the gate to control access. This practice will continue as long as the plant is operating. Once the plant is shut down the security guard will no longer be maintained at the facility. The gate will then be locked at all times to prevent access by the general pubic. The gate is posted with signs indicating the site is a controlled access facility. Signs are in both English and Spanish. Additional signs will be posted around the perimeter of the landfill also to warn of the hazardous waste landfilled there.

I-2b Maintenance

Maintenance of the cover will include as a minimum mowing the grass cover and irrigating the grass cover with water as necessary. The post-closure cost estimate includes money for mowing the facility nine times a year and watering the facility three times a year. An allowance for reseeding five percent of the facility area three times during the post-closure period is included.

The slope on the landfill cover will be resurveyed yearly during the post-closure period. Four benchmarks, installed as part of the closure activities, will be used in the survey. Money is included in the post-closure care estimate for 4 days of bulldozer work to maintain the cover slope if necessary.

The leachate collection system used during the active lives of Cells #1, #2, and #3 will be used during post-closure. Since Cell #1 does not have a synthetic liner and is located below sea level, this cell will continue to generate leachate as long as the cell is in existence. The leachate from this

cell will continue to be pumped and treated in the wastewater treatment facility during the post-closure period or until it can be demonstrated that the leachate poses no significant environmental or health problems.

Application of impervious covers to Cells #2 and #3 should eliminate leachate formation in these cells (since these will have synthetic liners). The leachate collection systems used during the active lives of these cells will be used as leak detection monitoring system during post-closure.

I-2c Groundwater Monitoring

Groundwater monitoring wells installed around the Puntilla Waste Management Area as required under the Interim Status RCRA standards (as amended by the Final Permit requirements) will be used during the post-closure period. Groundwater samples will be taken semi-annually and analyzed in accordance with the parameters set forth in the final RCRA permit.

Activities to maintain the groundwater monitoring wells include ensuring that the caps and seals are in good condition and that the wells are not damaged by the bulldozers. An allowance has been included in the post-closure cost estimate to provide for replacement of two monitoring wells during the post-closure care period.

I-2d Post-Closure Inspection

During the post-closure period the Dewatered Sludge Landfill will be inspected semi-annually by a licensed professional engineer. The purpose of the inspections is to provide supervision for the maintenance activities that are planned during the post-closure period. Deviations from the planned frequency and type of maintenance will be determined during these inspections.

I-2e Recordkeeping/Reporting

All required recordkeeping and reporting will be complied with during post-closure.

Contingency Post-Closure--Aeration Basins/Equalization Basins and Primary Solids Ponds

I-2a Security

Security at the facility will be maintained by continuation of existing controls. The land entrance to the wastewater treatment plant is enclosed by a fence and a security guard is present at the gate to control access. This practice will continue as long as the plant is operating. Once the plant is shut down the security guard will no longer be maintained at the facility. The gate will then be locked at all times to prevent access by the general pubic. The gate is posted with signs indicating the site is a controlled access facility. Additional signs will be posted around the perimeter of the landfill also to warn of the hazardous waste landfilled there.

An additional four foot high fence will be erected around the aeration basins and equalization basins. A locked gate will prevent unauthorized people from gaining access to the basins. The fence will be posted with warning signs.

I-2b Maintenance

Maintenance of the cover on the primary solids ponds includes as a minimum mowing the grass cover and watering the grass cover as necessary. The contingency cost estimate includes money for mowing the grass cover nine times per year and watering it three times per year. An allowance for reseeding five percent of the facility three times during the post-closure period is included. If the grass cover is well maintained, little maintenance of the caliche/bentonite cover should be required.

The elevation and slope of the primary solids pond cover will be resurveyed annually. Soil will be added as necessary to maintain the one percent slope. Money has been included in the estimate to bring a bulldozer in for 2 days a year for cover maintenance.

Maintenance of the aeration basin and equalization basin will involve mowing and watering the grass on the surface of the basin and reseeding any areas as necessary. Money has been included in the estimate to mow the grass nine times a year, water it three times per year, and reseed five percent of the surface three times during the post-closure period.

The slopes of the impoundments will be resurveyed annually and soil added as necessary to maintain the dike integrity. An allowance for eight days of bulldozer time per year is included for this activity.

I-2c Groundwater Monitoring

The groundwater monitoring wells installed around the Wastewater Treatment Facility during interim status and amended during final RCRA permitting will be used to monitor the facility during post-closure. Groundwater samples will be taken semi-annually and analyzed in accordance with parameters set forth in the final RCRA permit. Approximately three wells will be sampled to monitor the equalization basins and aeration basins and three wells will be sampled to monitor the primary solids ponds.

Activities to maintain the groundwater wells include ensuring that caps are present and casings are not damaged by bulldozers. An allowance has been included for replacement of one monitor well at each location during post-closure.

I-2d Post-Closure Inspection

During the post-closure period, the primary solids ponds, equalization basins and aeration basins will be inspected semi-annually by a licensed engineer. The purpose of the inspections is to provide supervision to maintenance activities during post-closure. Any modifications to the planned post-closure activities will be made based on these inspections.

I-2e Recordkeeping and Reporting

Required reporting and recordkeeping will be done during the post-closure period.

Post-Closure of Industrial Landfill

I-2a Security

Security at the facility will be maintained by continuation of the existing controls. The entire plant is enclosed by a fence and security guards are present at the gates to control access. This practice will continue as long as the plant is operating. Once the plant is shut down, the security guards will no longer be maintained at the plant. After shutdown, the gates will be locked at all times to prevent access by the general public. The gates are posted with signs indicating the site is a controlled access facility.

I-2b Maintenance

Maintenance of the cover will include as a minimum mowing and spraying the grass cover as necessary. The post-closure cost estimate includes money for mowing the facility nine times a year and watering the facility three times a year. An allowance has been included to reseed five percent of the facility area three times during the post-closure period. The grass cover will be well maintained, so little maintenance of the top soil and caliche/bentonite cover should be necessary.

The elevation and slopes of the landfill will be resurveyed once a year. Money is included in the cost estimate to bring in a bulldozer eight days a year for cover maintenance.

I-2c Groundwater Monitoring

Groundwater wells have been installed around the landfill site as required by the Interim Status RCRA regulation. Six groundwater samples will be taken semi-annually. The samples will be analyzed in accordance with the parameters set forth in the final RCRA permit.

Activities to maintain the groundwater monitoring well include ensuring that the caps and seals are in good condition and that the wells are not knocked down by the bulldozers. An allowance has been included in the post-closure cost estimate to provide for replacement of two monitoring wells once during the post-closure care period. This allowance should be sufficient provision for maintenance of the wells.

I-2d Post-Closure Inspection

During the post-closure period the Industrial Landfill will be inspected annually by a licensed professional engineer. The purpose of the inspection is to provide supervision for the maintenance activities that are planned during the post-closure period. Deviation from the planned frequency and type of maintenance activities will be determined during these inspections.

I-2e Recordkeeping and Reporting

All required recordkeeping and reporting will be complied with during the post-closure period.

I-3 Notices Required for Disposal Facilities

I-3a Notice to Local Land Authority

Within 90 days after final closure, a survey plot of the following facilities will be made and submitted to the appropriate land use authority in Puerto Rico and to the Regional EPA Administrator:

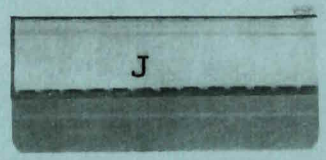
Dewatered Sludge Landfill
Wastewater Treatment Facility Impoundments
- Aeration Basins
- Equalization Basins
- Primary Solids Ponds

Industrial Landfill

The notice will be made for the WWTF impoundments only if they are closed under the contingency closure plans. The plot will include the type, location and quantity of hazardous waste in the facilities.

I-3b Notice in Deed to Property

Notification will be made on the deed to the facility property that hazardous waste remain in the designated areas within the above-named facilities. Land use will be restricted to those activities which do not disturb the cover or interfere with groundwater monitoring during the post-closure care period.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J-OTHER FEDERAL LAWS

Information will be provided in accordance with the requirements of 40 CFR 122.25 (a)(20) at the request of the EPA Region II office. At the time, however; we believe that the UCCI Plant is in compliance with the following Federal Laws:

1. Wild and Scenic Rivers Act

2. National Historic Preservation Act of 1966

3. Endangered Species Act

4. Coastal Zone Management Act

5. The Fish and Wildlife Coordination Act

WP0040E

K

K CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature: Charles R Kline Date: 12/19/83

Charles R. Kline,
President
Union Carbide Caribe Inc.